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Farm Poultry.

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FARM POULTRY.

By

F. C. ELFORD,

Late Manager and Instructor
of Poultry Department
Macdonald College
P.Q.

Post Office :
Macdonald College, Que., Can.

Railway Station and Express :
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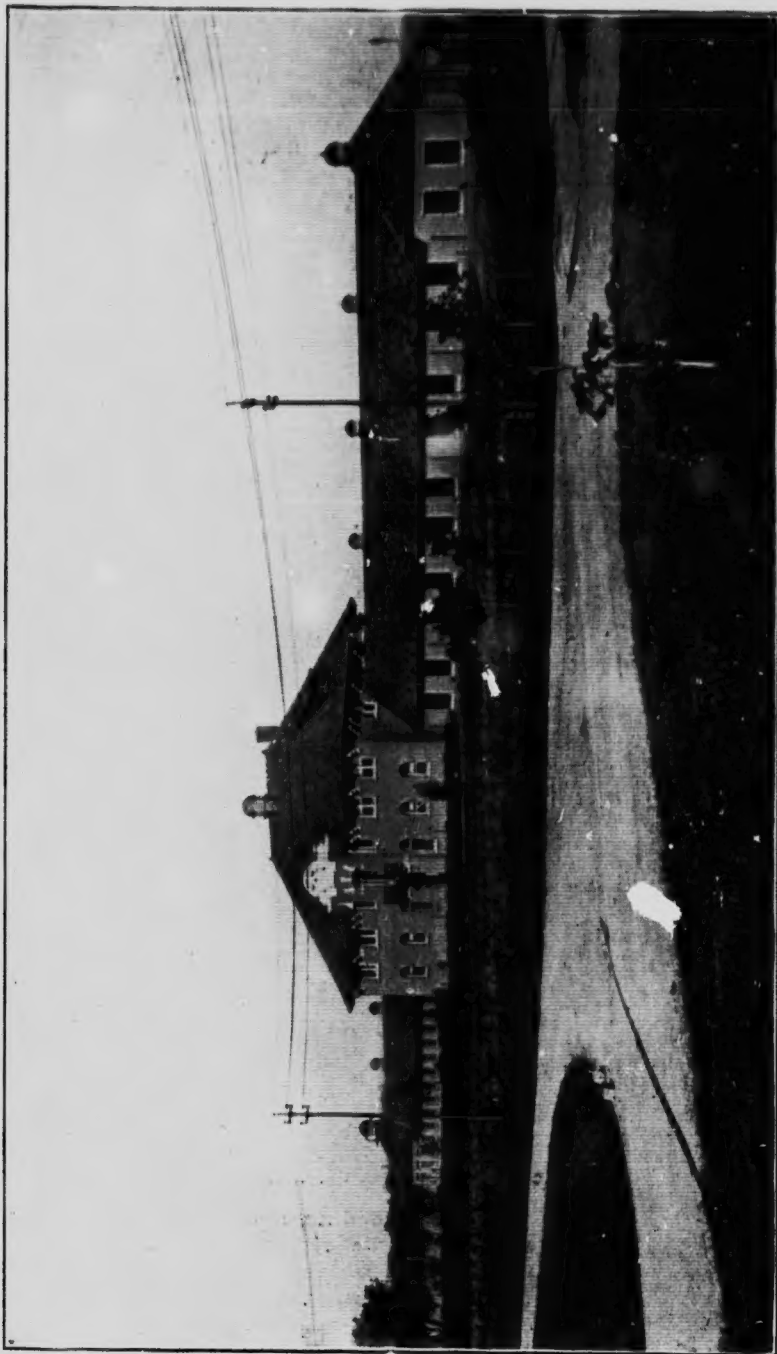
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FARM POULTRY.

I. INTRODUCTION.

Poultry Keeping Suited to All.—Poultry keeping is one of the most valuable industries carried on in connection with every well-conducted farm or rural home. The money-making possibilities of poultry farms may be in doubt, but hens can be made pay on even the poorest farm in the Province. Probably no class of live stock is so widely scattered and universally reared. From the warmest regions of the tropics to the cold, bleak regions of the Yukon, man demands eggs as one of the staple articles necessary to sustain life. Fresh eggs are preferred, therefore the hen has been introduced, and poultry has become adapted and acclimatized to all regions inhabited by civilized man. The flesh of fowls is delicious and nutritious; and eggs, one of the most perfect of human foods, are being used more and more.

In former times poultry keeping was, and in many places is yet, a side issue, a mere incident to general farming, its responsibilities and cares falling on the overworked housewife or some of the very small children. The fowls gathered their own subsistence, stole their nests, brought forth a few chickens, which lived or died according to conditions. The poultry was compelled to roost in the trees, on the fences, or perchance in the barn. About the only care given was to occasionally throw them a little food.

It is only recently that poultry keeping has become a distinct department of the farm. Now, all over the country people are awaking to the possibilities of the industry. Better accommodation is being provided and standard bred stock is supplanting the mongrel and scrub.

To meet the ever increasing demand for information we are issuing this bulletin. We hope it will cover the more important points and give a working idea of the things we find necessary for the successful raising of poultry in this Province. We pride ourselves in the fact that the commercial part of our poultry plant at Macdonald College is just an enlargement of an equipment that it is possible for the poorest farmer in Quebec to duplicate.

Large numbers of periodicals are devoted exclusively to the promotion of the poultry interests, whilst ever, farm paper gives liberal space to the fowl tribe. Agricultural colleges, experimental stations, etc., are aiding the cause by publishing from time to time the results of their investigations. Poultry shows and fairs have been of great benefit. These forces, coupled with the efforts of altruistic poultrymen scattered here and there over the country, are making the keeping of poultry a pleasure instead of a nuisance.

Farm Poultry.

A Few Figures.—Reliable authorities agree that the average hen lays in the neighborhood of 80 eggs per year. Hens that have laid over 200 in a year are by no means rare; so there is vast room to improve the egg-laying capacity of the average hen. Doubtless this low average is due to the fact that many people never dispose of a hen. So long as she lives she is supposed to lay. Many experiments have gone to prove that as each year a hen grows older her egg-laying ability decreases 25 per cent.

Some people believe that when a hen is not laying she requires but little food, and consequently many farm flocks are not ready to lay until after the season of high prices. By killing off his old hens and by proper feeding the modern poultryman can easily raise the average of his flock up to 100 eggs per year, and the more successful may obtain an average of 120 eggs per year per hen. When intelligent care will add 50 per cent. to his income, the poultryman is well rewarded for spending some time to gain the necessary information.

The latest figures at hand show that the average number of fowls per farm in Quebec is less than 30. There are about 160,000 farms in the Province. The average yearly production of eggs on each Quebec farm is about 205 dozen, which at 15c. means an income of \$30.75 per farm, or nearly \$5,000,000 a year for the whole Province. It is easily seen that if the average egg production could be raised to 120 eggs per hen per year, the income from eggs would be increased by \$2,500,000. If proper methods were used in marketing, a much higher average price than 15c. could be obtained, and this income from eggs might be easily increased by \$4,000,000. This might be accomplished with but little, if any, increase in the amount invested.

Did the average farm keep 50 hens instead of 30, the average flock should lay 342 dozen per year, which at 15c. per dozen, would amount to \$51.30 per farm, or over \$8,000,000 for the Province of Quebec. Suppose that these 50 hens were so well fed and cared for that they laid 120 eggs each per year, the income of the Province from eggs alone would be \$12,000,000, a gain of more than \$7,000,000 over present conditions.

II. POULTRY HOUSE CONSTRUCTION.

Some Essentials.—The time has long passed since it was profitable to leave fowls to roost in the trees or on the fence, and gather a living from the refuse of the barn yard, therefore we must consider the matter of poultry houses.

A good house should be comfortable, sanitary, convenient and economical.

A Comfortable House.—A comfortable house means one that is dry inside and with sufficient sunshine and ventilation.

Sanitation.—The poultry house must be kept clean; not that it will be swept and scrubbed out every day, but be kept free from foul odors and vermin. Some system should be adopted for cleaning and disinfecting. The simpler the system, the more likely it will be carried out, and the better the chances for good results. Thorough ventilation is most important. Many of the ills to which poultry are susceptible are caused by lack of fresh air. Let in lots of fresh air and sunlight; the house will be dry and healthy, and only the microbes of disease will be killed!

Economy.—Economy should always be practised in house construction. A house can be built too expensively as well as too cheaply. Few people expend too much, though occasionally it is done. The aim should be to build a house that suits conditions with as little expense as practicable. Experience has shown that instead of shutting in the hens to keep them warm, it is better to open the house to keep them healthy; instead of the closed and damp house, the open house is better. By this means, instead of having weak, sickly hens, we have strong, vigorous flocks that lay in cold houses when eggs are dear.

The houses that are being built to-day are sensible; though they have plenty of air, they have no draughts; though they are cold, they are dry; and though they shelter more hens to the square foot, there is no dampness. Two great essentials that can be had for the asking are provided—sunlight and fresh air—and with these there is no reason why we should not have a healthy and hardy race of fowl.

Location of the Poultry House.—When movable houses are used the location is of minor importance, as it can be changed every day if necessary; but when permanent houses and yards are erected, the question of location is of great importance.

It is true that the poultry plant on most farms is already located, and if not in the best situation, the best that can be done is to try to improve conditions. Where, however, there is a choice of location, it is well to consider some of the points that make an ideal situation. It might be noted that no two conditions are exactly alike, that what may suit one may not suit another; that because one man does well with a certain equipment, it is not conclusive reason that another man expects to do the same. This being the case, hard and fast rules cannot be

laid down; but there are certain general principles that might assist one in the choice of a location.

The Location must be Dry.—For this purpose light land gives best results; by this it is not meant that sandy land is to be preferred; land may be so sandy that it will not grow anything green. Better to have land that will grow green food for the poultry than bare sand, but a good natural drainage is desirable. Where heavy land only is available, underdrainage is essential. It is best to place the house on the highest part of the land, so that all surface water will flow away rather than toward it. It should be placed where no water can collect or floods gather. It should never be placed in a hollow, not only because the water flows there, but because of the atmospheric drainage. The cold, damp air flows to the hollows and settles there. A low place, though sheltered from the wind, may be several degrees colder than a higher place a few yards distant. The floor of the house should be at least six inches higher than the surrounding land.

Aspect.—The front of the house should face south or south-east. The windows should face the direction from which most sun shines. Houses facing the sun get the largest amount of light, which will make the house bright and more home-like. It is an advantage to have the land fall away from the south side of the house.

Windbreaks.—If poultry houses are placed on the top of knolls they will get more wind than if placed in hollows. Too much wind is undesirable, and protection must be provided against it. If there is a bluff or an orchard, or any other windbreak, place the house on the south side of it. In some sections, where the wind is very severe, it may be of advantage to plant an artificial windbreak. Better, however, to have the dry location with wind rather than a damp location surrounded with windbreaks.

Convenience.—The poultry plant should be convenient. It should be "get-at-able" for the manager or feeder. So often, no thought is expended on the location of farm buildings, poultry houses in particular. The poultry house is just as likely as not to be situated at the far side of the stables and as far distant from the house as possible. As a rule the women on the farm look after the poultry, and poultry work is often made much harder than is necessary. Owing to inconvenient arrangements the person who feeds the poultry often spends at least double the time and walks twice as far as is necessary. No matter who is to look after the poultry, put the house where it is easy of access, and also make it possible to feed the poultry without having to run to the stable or granary for grain. In the construction of gate, door, driveway, and everything connected with poultry, convenience should be studied. Often this one item determines the difference between a pleasure and a drudge, and the one is as easy to have as the other. Not only should the house be accessible, but the internal arrangements ought to be such that the necessary work may be done with a minimum of labor.

A gate that swings both ways is a convenience, likewise a door wide enough to admit a wheelbarrow and high enough to avoid striking the head. Inside have a barrel or overhead box, into which a sack or two

of feed can be put from the load at the door. On a card above may be marked the amount of feed put in during the year; on this same card may also be marked the number of eggs, setting hens, etc. The feed-box will insure that there is food when the time to feed comes. A measure may be kept in the box, and the feeding operation is simple.

If the work in the hen house were as easy to do as that in the horse stable, there would be fewer filthy poultry houses and much better returns.

Permanent vs. Movable Houses.—A permanent house is any house that is built on a permanent foundation, while a movable house is one



FIG. 2.—POULTRY HOUSES AT MACDONALD COLLEGE AS THEY APPEAR IN SUMMER.

which is so constructed that it can be moved from place to place. Movable houses are necessarily small. They are very often called colony houses. A movable house is always a colony house, but a colony house is not always a movable house, as it may be built stationary. Colony houses contain only one family or colony of birds, hence the name.

Both styles of houses have their advantages and disadvantages. The permanent house can usually be built at a less cost per hen capacity. In bad weather it is easier to get from one pen to another, and the hens are probably better protected from the cold and wind.

On the other hand, the movable colony house is simply made; may be moved from place to place as feed, weather, and convenience suggest. For the small village lot or the land too rough to move the house, there is no advantage to build it movable. For the farmer or poultryman who has fairly level land, the movable house is a decided advantage.

Farm Poultry.

One of the troubles in keeping poultry housed in permanent houses is the difficulty of keeping the land pure and sweet. With the movable house the yards can be changed at will; the poultry may be kept in one field after another, thereby the poultry, instead of becoming a nuisance, are a decided advantage. They help scatter fertility over the farm, which later may be turned under for crops. Where poultry are used in combination with a fruit farm, the houses are moved along the edge of the orchard. Movable houses may be used most advantageously with ordinary farm crops, especially with corn, roots, etc. In growing grain young chicks are easily reared in movable houses located along the headland or in the rough part of the field. The grain forms a protection against the hawks, etc., and the little damage that may be done to the grain is more than compensated for by the bugs and insects eaten by the chickens.

An added advantage in this method (the movable house) is that a comparatively small outlay is required to start. Only sufficient house room to accommodate the present flock is required, additional houses may be built each year as the flock increases. Feed that might otherwise go to waste may be utilized. More advantage of the weather can be taken. In the spring the houses can be drawn into the sun, and as the weather grows warmer they can be taken to an orchard or grove where the trees will shade the birds from the hot sun.

With movable houses, fences are not essential, while a permanent house requires a permanent yard, the fencing of which costs often as much as the house. The colony housing makes it possible to use a system of feeding that saves labor. Where the birds have unlimited range they can be fed by the hopper system better than when they are yarded. This method of feeding saves much labor and can be best used in the colony system.

CONSTRUCTION.

Materials.—In deciding what material to use in the construction of the poultry house the two points, efficiency and cost, are of most importance. The question of appearance will have some weight; and, of course, where one can get elegance with a low cost and maximum efficiency, it might be considered. As a rule wooden houses give the best results; in many sections wood is the cheapest material. The cost of the materials must be considered, and, other things being equal, use the cheapest material. As for efficiency in material it is necessary that the wall provide suitable insulation and a dry atmosphere; a solid cement wall is not as satisfactory as the hollow block. Where solid walls are constructed insulation must be provided on the inside. Satisfactory houses may be built with all kinds of material so long as the hens are made comfortable.

No Nooks and Corners.—Poultry houses are easily dirtied—the scratching of the litter by the hens fills the house with dust and dirt; the house should, therefore, be made with as few nooks and corners as possible.

Insulation.—Where double walls are built, shavings with lime added to keep out the rats are better as a filler than saw-dust. Tar paper is a very useful material in the walls. The aim should be to make the place free from draughts rather than frost proof, and all openings used should be on the south side.

Floors.—Floors are in many places made of earth. Where rats are present, it is better to use cement, in fact there is no floor as suitable as the cement floor; it is rat proof, it is dry, it can be constructed fairly economically, and it will last as long as the house. Objection has been raised to the use of cement for floors owing to the cold nature of the cement, but where litter is used, as it always should be in this climate, poultry will not suffer on this account. Wooden floors should not be placed flat on the ground. If a rat can get underneath, make it high enough for a cat to follow.

Height of the House.—Just how high the ceiling should be depends entirely upon the feeder. All that the poultry require is that the place be high enough to get thorough ventilation and sunlight. A few feet, therefore, might be high enough to suit the poultry, but such a house would be so inconvenient that few people would care to enter it. The highest part of the roof should be where the feeder walks when attending the fowl, the lower part will in all probability be high enough for the hens.

Cold vs. Warm Houses.—As has been stated, the cold house is not satisfactory simply because it is cold, but because suitable conditions can be more easily obtained. A house built warm enough to keep water from freezing is hard to ventilate. Should the windows be used for this purpose, the house is cold anyway, and the extra expense is not practical. Ventilation must be provided even if the heat is sacrificed. Should artificial heat be introduced, it is hard to keep it uniform; and experience has shown that there is more sickness in a heated house, and poorer fertility from the hens. It is not claimed that a warm house may not provide just as many eggs for the time being, but the fertility is poorer and the strength of the germ weaker, and if warm houses are used, each succeeding year witnesses a flock of poultry with a weaker constitution.

Alleyways.—In long houses alleyways are extensive, and they do not always economize labor. There are conditions where an alleyway may be essential. Alleyways aid in showing various pens or breeds to advantage. For the practical poultry man, however, the alleyway is nothing but a bill of expense. A feeder can feed his fowl just as well going from pen to pen as he can by means of an alley. The contention that one can do most of the work from an alley is not practical. Feeders who do best with their poultry want to get right into the flock, and are not satisfied without seeing how each pen or individual is taking the food. The feeder cannot get too well acquainted with his birds, and the best way to know them is to go through the pen often. Doors should, however, be wide enough to admit a wheelbarrow, and should swing both ways. In extra long houses, food carriers are sometimes used to advantage.

Floor Space per Hen.—This question the same as many other questions connected with poultry house construction cannot be answered definitely. The floor space which a hen requires depends upon several things:—

1. The breed of the hen. Some hens require more space than others.
2. The nature of the food and how fed. Hens that are fed hard grains in the litter during the winter will acquire all the exercise necessary without much floor space, for the getting of food entails considerable effort.

3. Ventilation. The house poorly ventilated will not accommodate so many hens as the house that is properly ventilated. A few years ago, when poultry houses were kept warm instead of being ventilated, it was thought that each hen should have between 8 and 12 square feet of floor, and in all probability she did, but the same breed does better now in the house properly ventilated, with 4 square feet of floor space than her ancestors did with 12. In other words, the more air admitted, the more birds can be accommodated.

Roosts.—(See Fig. 4.) The American breeds require about 9 inches per hen of roosting space. If more than one roost is required, place the first about 10 inches from the wall, and the others from 18 to 20 inches apart. Roosts should not be placed too high. Between two and three feet from the floor is high enough for most breeds. High roosts give trouble in that the heavier birds are not able to reach them, and the jumping down sometimes causes bumble foot and kindred diseases. Roosts should never be constructed on the ladder principle, but where more than one roost is required they should be placed on the same level. When roosts are placed one higher than the other, there is considerable commotion every night as the hens are going on to the roost. Weaker hens usually go to roost first, and of course take the top places. The strong, vigorous hens going later also wish for the top seat, and displace those already roosting. This occurs every night. To get rid of this trouble place the roosts on a level.

Roosts should not be large; the round edge of a 2 x 3 inch scantling is large enough. Round cedar poles serve the purpose very well, but the splitting of the poles causes cracks in which vermin harbor. Roosts should be made movable so that they can be cleaned easily. It is a good plan to hinge the roost to the wall, and to have it raised in the daytime or when cleaning out. The roosting quarters should always be on the warmest side of the house, or at least farthest away from the windows. No ventilation should be admitted near the roosts; sometimes where nights are especially cold, a cotton screen is let down in front of the roosts. This is an advantage, as it keeps the roosting quarters a little warmer; but the custom of boarding up the roosting quarters is not good if the sunlight is shut out.

Dropping Boards.—These are platforms built under the roosts for the purpose of catching the droppings. Where these boards are used they should be placed 10 to 12 inches lower than the roosts. A convenient width is 20 inches for one roost and 3 feet for two. Dropping boards require cleaning at least once a day if the place is to be kept neat and

clean. In cold houses where everything freezes, a dropping board is a nuisance, and many poultry keepers are discarding it. A farmer's poultry plant can do without a dropping board, and the house can be kept just as clean and more presentable with less labor. For those, however, who have time to clean the board and who prefer using it, have it cleaned twice a day, and covered with sawdust or some other good absorbent.

Number of Nests.—During the winter time hens do not require as many nests as are necessary during the summer time. Usually one nest to every six hens will be found sufficient. During the cold weather fewer nests mean fewer frozen eggs.

Ventilation.—The various systems used in ventilating stables and other buildings have been tried again and again in connection with poultry houses. So-called ventilators have never given best results. The trouble seems to be that where artificial ventilation is introduced, the evil effects overcome the good. Ventilation by means of a window or cotton front is generally used for changing the air in the poultry house. Where the house is practically tight on three sides, the window or the door can be opened and the air in the house changed without affecting the poultry. Hens must have pure air, but this pure air can be obtained through the windows and cotton front, and if there should be dampness in the house some simple arrangement must be made to allow the fresh air to enter. To assist ventilation, the straw loft is often used. Poles, wire fence material, or anything sufficiently strong can be stretched along the ceiling. The straw will absorb the moisture from the atmosphere of the house, thereby keeping it dry. It will also help keep the house warmer in winter and cooler in summer. Through the straw a little fresh air may be allowed to circulate from an opening at one end under the gable, or there may be an opening at both ends if the straw be thick enough. When poultry is situated in part of another building, the straw used for feeding or bedding purposes will benefit the poultry if stored over the m. Never, however, have a tight ceiling. There must be sufficient space for the air to pass from the poultry house into the attic. Where the poultry pen is placed in one corner of the stable near the stock it is difficult to keep the pen dry. A tight partition between the poultry house and the stable is an advantage, but a straw loft with an opening above the poultry compartment is almost a necessity. By all means have the poultry house on the side with the southern exposure, and do not be afraid to give plenty of ventilation through the window or door.

Construction of Windows.—Houses should be so constructed that the sunlight may reach every part of the interior. Sunlight promotes health and kills bacteria. The variation in temperature between day and night must be considered. Too much sunlight unduly heats the house during the day time, and the more glass there is the cooler the house is at night. No rule can be given, but roughly speaking about one-third of the front of the house might be of glass.

Windows should be arranged with the longer side upright. A window 3 x 5 feet placed with the 3 feet side up will not be as satisfactory

as if it were placed the other way. The rays of the sun going through a vertical window strike more of the interior, just as a wider broom sweeps a wider swath.

Remodelling.—On many farms there is not an up-to-date poultry house, but there may be outbuildings partially used for other purposes which can be economically changed into poultry houses. There are some farms that have poultry houses entirely unsuitable, which a few hours' work might transform into houses much more comfortable, and from which better results might be obtained. The windows may have been placed too high or too low, or there is not enough light.

Put in a fair-sized window in the south side; bank up or reline the north side, and put the roosts along that wall. Pull down all slanting roosts and make them level. Have all the openings in one side, so that if the window be left down, the wind coming in would be like wind blowing into a bottle, thus minimising draught.



FIG. 3.—MOVABLE COLONY HOUSE AT THE EDGE OF A CORN FIELD.

Foundations.—The foundation of the permanent poultry house is very important. It should be deep enough to prevent heaving by the frost, solid enough to prevent rats from digging through, and sufficiently high to keep the water from getting in. Cedar posts are often used for foundation purposes. They are, however, unsuitable because they do not remain even. By having a house too high a space is left underneath which provides a shelter for rats and other vermin. A stone wall is good, but probably the best foundation is cement. The wall should be set in a trench, the bottom of which should be below the frost line. Six to twelve inches of loose stone may be placed at the bottom for a drain. Then, if a cement floor is laid in the house, a foundation and floor are provided which are proof against moisture, rats, and decay.

FENCES AND YARDS.

Fences.—Where stationary houses are built (and there are many places where the movable house will not be practicable), permanent fences and yards will be required. It is always wise to put in good fencing. Wire is better than so-called poultry netting, as the netting is short lived, draws up from the ground, and hangs down from the top to such an extent that it is a never-ending worry to keep poultry in or out. Good serviceable poultry fences are made by most fence companies, and as a rule the best are the cheapest. The best method for planting the farm post should be followed; the corner post must be especially firm, as the slightest sag in the poultry fence is more serious than in the ordinary farm fence.

Height of Fence.—For American breeds fences do not require to be over 5 feet high, but for light breeds a couple of feet more will be necessary. Never put a pole on the top of a fence, as it affords a lighting place, and the fowl will more easily get over. For those who make their own fences, the following measurements may assist. In a fence built of 16 wires the various distances between, counting from the bottom, should be $1\frac{1}{2}$, $1\frac{1}{2}$, $1\frac{1}{4}$, $1\frac{1}{4}$, 2, $2\frac{1}{2}$, 3, 4, $4\frac{1}{2}$, 5, 5, $5\frac{1}{2}$, 6, 8, 8 inches. A barbed wire can be put on top of this if necessary.

Size of Yards.—The larger the yard the better. Large yards, however, are not always available, and smaller space has to do. For economy the yard should be square. Where only one breed is kept, it is better to let several pens of fowl have the run of a large yard rather than cut it up and give each pen a part. Every internal fence that is removed adds to the liberty of the individual hen. Yards should be so arranged that they can be cultivated by horred implements. To have healthy hens, the yards must be kept sweet, and to do this it is advisable to cultivate and grow crops. Double yards are an advantage. By double yards is meant that the fences are so arranged that the hens can be let into one part of the run for a while and then into the other. This gives an opportunity to cultivate and grow a crop in the yards alternately. The bare yard, with no shade and never cultivated, is sure to result in sickly poultry.

Crops Suitable for Yards.—Grain of any sort will do well in the poultry yard. The poultry may be allowed in the standing grain in the summer. It provides shade and feed. A root crop, followed by wheat, rye, or potatoes does very well. The yard is also the best possible place for the kitchen garden. When garden or roots are wanted, it is an advantage to sow something between the rows as the various vegetables are taken off. The crop thus sown will supply green food for the poultry during the fall and following spring. Winter rye makes a good late fall and early spring pasture. If it is sown about the first of September, it will provide considerable green food before winter comes and after the snow is off. As the rye gets older it becomes too coarse for small or growing chicks and not the best for older birds. By this time, however, something greener and softer can be provided.

Rape, corn, cabbage and such crops make splendid green food. In fact anything grown as a green crop will answer.

Where it is impossible to cultivate or have the movable yards, a more permanent crop may be sown. Where alfalfa can be grown, there is no green food upon which hens do better. Unless overcropped or pastured too soon, alfalfa will supply an abundance of valuable feed. What is not eaten off while green can be cut and cured for hay. This can be fed to the hens during the winter.

Shade.—Whether free range or yards are used, shade is a necessity. Shrubs and trees answer very well, but if they are not present, artificial shade should be provided. Many of the green crops, such as sunflowers and artichokes, will provide an abundance of shade as well as a protection from the hawks, and are very valuable plants for feed.

Sunflowers can be planted in clumps or rows, as is most convenient. The seed is sowed much the same as corn. It may be sown with a drill or with a hoe. The better condition the land is in and the more thorough the cultivation, both before and after sowing, the better will the plants grow. In a few weeks the plants will provide some shade for the chicks. By the time the seed ripens the moulting season is on, and the seeds are rich in protein. They, therefore, make an excellent addition to the ration at the time of the production of new feathers.

Artichokes are more like alfalfa, as they are more permanent in their nature. They resemble the sunflower, but the leaves and blossoms are very much smaller. They should be planted in a place where they can be left for several years at least. They are grown from tubers like potatoes, and can be planted in the same manner. In growing artichokes the system used in the cultivation of corn may be followed. They provide excellent shade and scratching ground for all kinds of poultry. In the fall the tubers make good food, and may be stored for winter use the same as potatoes.

A good way to feed artichokes is to turn the hogs into the patch a few weeks before the ground freezes up. The hogs will root and eat them just as long as any tubers are to be found. Let the poultry accompany the hogs, and a lot of cheap feed will be provided. In the spring cultivate the land well and leave it alone, and there will have been sufficient tubers left to reseed the plot. Should the artichokes come up too thick, run the horse hoe through and cultivate the same as for corn. This system provides cheap shade and an abundance of fall feed.

HOUSES USED AT MACDONALD COLLEGE.

At the College there are three types of house in use.

1. Permanent House.—The long house which is attached to the poultry building has been in use five winters. It is 120 feet long and divided into six pens. In each pen 50 to 60 hens are kept. There are no drop boards, and the roosts are arranged to hang against the wall in the daytime. The windows slide, and a strip of cotton nailed over an opening a foot wide above and below the windows assists in the ventilation of

Poultry House Construction.

17

the house. There is an alleyway, which though seemingly necessary in an exhibition house, is unpracticable. It has been found necessary to put cotton on the screens between each two pens, as the draughts in

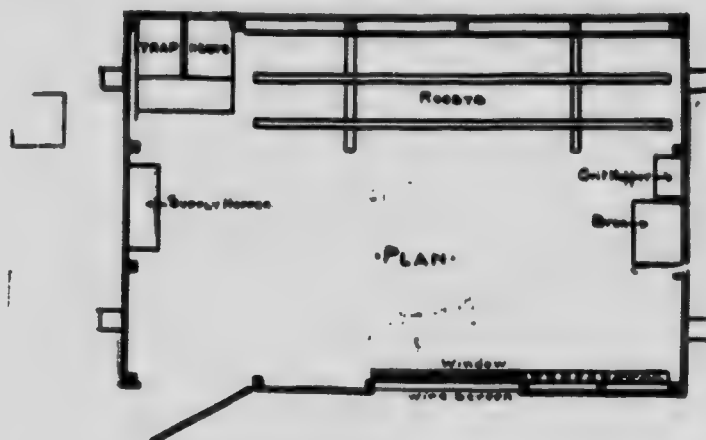


FIG. 4.—COLONY LAYING HOUSE PLAN.

this house are hard to overcome. The walls and floor are cement. A loose board ceiling, over which is placed straw, assists in the ventilation.

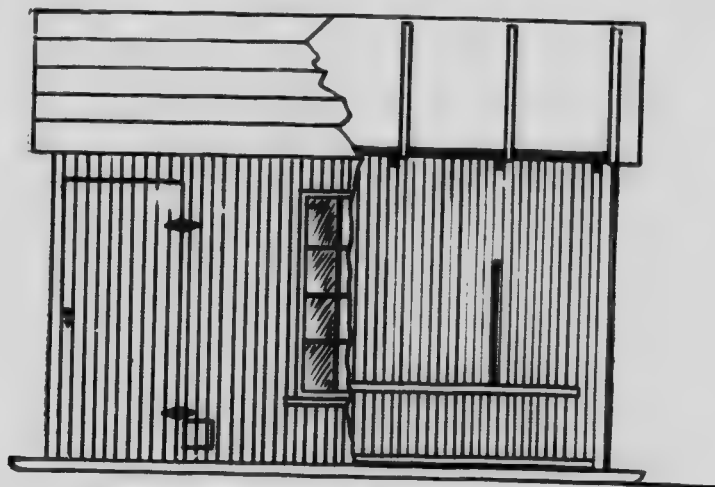


FIG. 5.—COLONY LAYING HOUSE CONSTRUCTION.

2. Colony Laying House.—(See Figs. 4, 5, and 6.) The colony laying house, which is built throughout the year, is 8 x 12 feet, 7 ft. to the top of the p. The house is built of one thickness of boards,

except behind the roosts where it is doubled. The ceiling is made of boards placed one inch apart, and the gable is filled with straw. A door cut in one gable helps let the air circulate through the straw. The door has been situated in the end, but it is better to have both the door and the window in front. Thus it is impossible to make a leaky house by forgetting to shut the door. The roosts are placed a couple of feet above the floor and are hinged so that they may be hung up during the day time if desired. No dropping boards are used in the house. Each house is fitted with nests, a bran hopper, a grit hopper, and a shelf upon which to set the water dish. See Fig. 20.

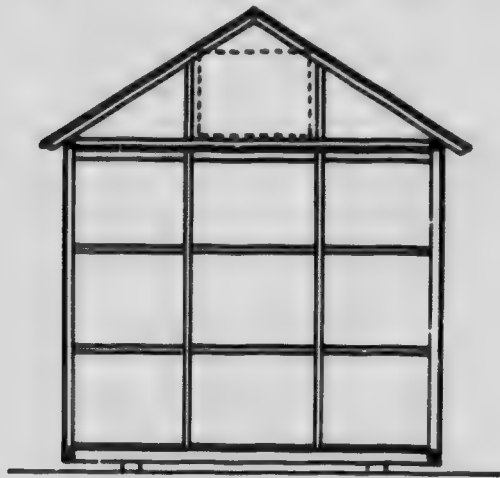


FIG. 6.—COLONY LAYING HOUSE CONSTRUCTION.

In the spring these houses make good brooder houses when equipped with three adaptable brooders. The following is a list of lumber required for the construction of one of these houses:—

	Feet.
324 feet 1 x 4—12, Planed T. and G.	324
2 pieces 4 x 4—13	35
96 feet 1 x 6—12	96
6 pieces 2 x 4—8 (Beams)	32
4 pieces 2 x 4—12	32
17 pieces 2 x 4—6 feet 3 inches	75
4 pieces 2 x 4—8	22
6 pieces 2 x 4—8	32
36 feet 1 inch 2 x 4	27
12 pieces 2 x 4—6 feet	48
15 pieces 1 x 5—12	75
18 feet 1 inch 1 x 2 Window Slide	3
108 feet Flooring, 12 feet long	108
150 feet Spruce 5—10 inches wide, 13 feet 4 inches	150
1 piece 2 x 4—12	8
2 pieces 4 x 6—13 (Runners)	56
	1,123

This type of house has been used for American breeds for five winters. The results have been most satisfactory. It has been fully demonstrated that hens can be kept in a cold house in the Quebec climate.



FIG. 7.—BROODER COLONY HOUSE, USED FOR GROWING CHICKS.

3. Brooder Colony House.—The other type in use is the "A" shaped house. This house is 6 x 8 feet, mounted on runners like the

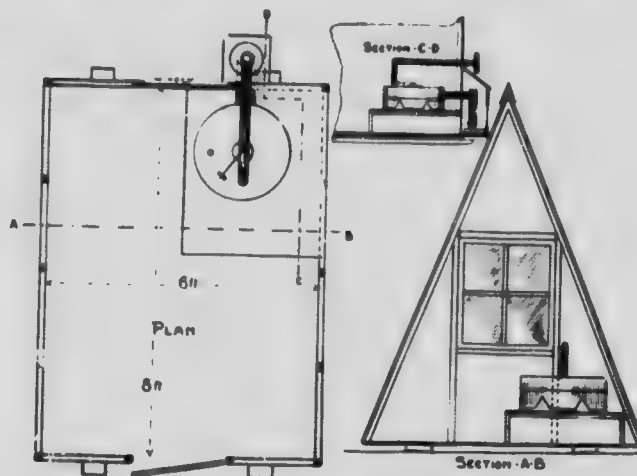


FIG. 8.—BROODER COLONY HOUSE. PLAN AND SECTION, SHOWING CONSTRUCTION

larger colony house. The two sides are brought together at the top to form the roof. At one end is a door, and at the other is a window hinged at the top. This type of house is cheaply constructed, and when

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fitted with an adaptable brooder makes a fine house for rearing young chickens. As soon as they get old enough to do without the heat, the brooder is removed, and a roost put in place about a foot above the floor.

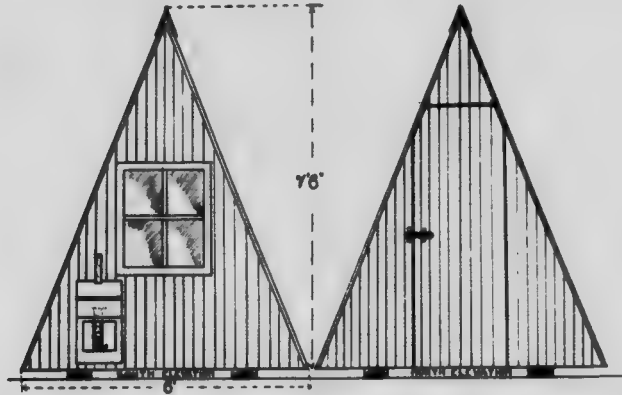


FIG. 9.—BROODER COLONY HOUSE. END ELEVATIONS.

The cockerels are gradually sold off or removed, and the pullets left to continue their growth in the same house. Thus there is no interruption to the growth of the pullets. See Figs. 7, 8, and 9.

III. BREEDING STOCK.

How to Choose a Breed.—The old question often arises, which is the best breed? Various answers are given. It is often said that the one you like best is the one for you. Others will say that it does not matter what breed is chosen, the whole thing is in the strain. Both of these replies are more or less correct, but neither answers the question. The breed for which one has a preference is not always the best and there is something in breed as well as strain. There are breeds entirely unsuited to farm conditions, to the local climate, and to nearby markets. There is a right breed for the farmer, though it may not be the same in every case. He should, however, be able to choose intelligently by considering his locality and his markets.

The Hardier Breeds for the Colder Climates.—Where one has not given the breed question serious thought, it is well to consider what has given good results in one's own locality. As a rule the breed that is most popular in a farmer's neighborhood will be the best for him. It is never good to choose a breed just because no person in the locality has it. It would be better for everyone if only one breed was kept—not only each farm, but every farm at the one shipping point, should have the same breed.

It may be that there is no good breed in the section, then it will be necessary for the farmer to get something different. In that case, get a breed that does well in a like climate under similar conditions.

It is well to take into consideration the market and its demands. The average farmer cannot always cater to a special market, but there are few who get as much out of marketing as they might.

The quantity of the poultry and egg supply, summer and winter months, must be considered. If there is a good local summer demand, a different breed might be kept than where the demand is for winter eggs. The broiler and roaster market, the breeding trade, and many other points might be well considered in the selection of the breed. For the average farmer in Quebec good results should be obtained from a hardy breed that will lay a fair number of eggs throughout the year and a number of these during the early winter months, and one that will give good table birds when killed.

The American breeds seem most suitable, and the favorites are Barred Plymouth Rocks, White Wyandottes, and Rhode Island Reds, given in the order of popularity. Where there is a good summer egg trade, the Leghorn will be found satisfactory. Leghorns will also produce chickens that might be sold as broilers of about three pounds to the pair. For eating purposes they are not very profitable after that weight.

Barred Plymouth Rocks.—(Fig. 10.) The Barred Plymouth Rock is no doubt the most popular Canadian fowl. They are hardy, good

table birds at any age, good layers, and will lay a good proportion of eggs in cold weather. The eggs are large and uniform in color and size. The hens should not be kept after the second laying season, as they have a tendency to put on flesh and become broody.

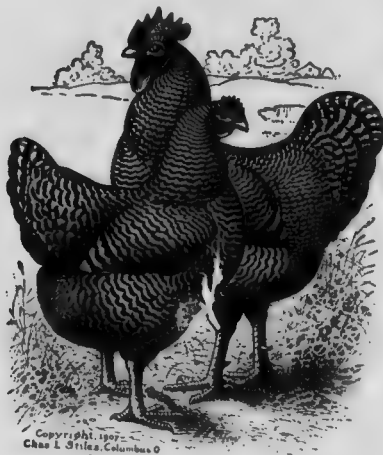


FIG. 10.—BARRED PLYMOUTH ROCKS.

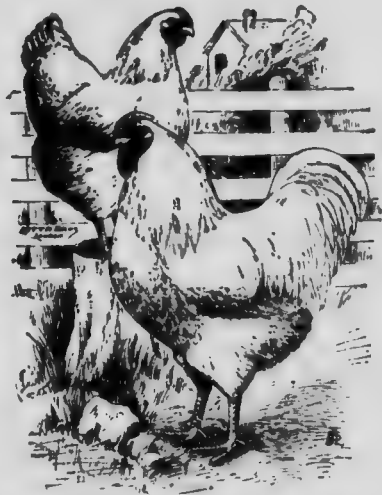


FIG. 11.—WHITE WYANDOTTES.

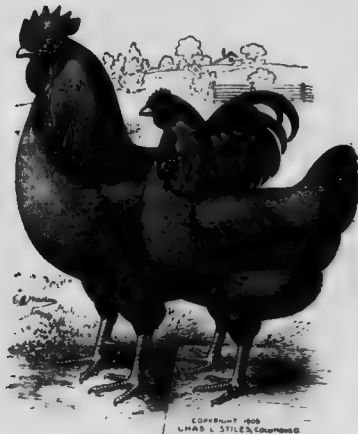


FIG. 12.—RHODE ISLAND REDS.

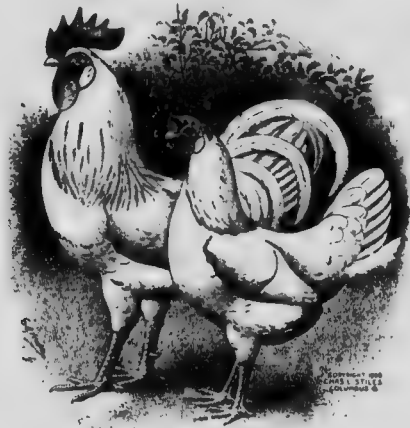


FIG. 13.—WHITE LEGHORNS.

White Wyandottes.—(Fig. 11.) The Wyandotte has eight varieties recognized by the "Standard of Perfection," the White being the most popular. The pullets mature early, are good layers, good table birds, plump, and with an absence of coarseness. They are not quite

so hardy as the Rocks, and the eggs are not so large or uniform in color or size.

Rhode Island Reds.—(Fig. 12.) The Rhode Island Reds have not been as long established as the Rocks or the Wyandottes. There are two varieties, the Rose and the Single Comb. They have a peculiar shape of their own, having a longer back than most breeds and an oblong body. They are very hardy and good winter layers. As yearling hens they lay better than the Rocks or Wyandottes. Eggs are uniform and of a fair size. They are persistent sitters, and not as good for table use as the other two breeds mentioned.

Leghorns.—(Fig. 13.) The Single Comb White and the Rose Comb Brown have proved very good layers, especially during the summer, and if kept in fairly warm houses, also during the winter. Where a new-laid egg trade is catered to, it may be an advantage to add one of the Leghorn breeds to insure a regular supply of eggs. The young cockerels up to 6 and 8 weeks old can be disposed of as broilers, the earlier ones bringing a good price. The older birds, however, are not good for the table, and the quality of the flesh is never as good as with the American breeds.

Pure Breeds.—The farmer has just as much right to pure bred poultry as any person. The old saying that mongrel stock gives best results has not proved true in experiments. Not only should the foundation stock be pure, but there should be a continuous selection year after year, and only by this means can best results be obtained. No inferior stock should be used for breeding purposes. Only birds of the best type and strongest constitution should be bred. If such are used, there is little occasion to go outside of one's own flock each year to get breeding cockerels. It might be an advantage to do this occasionally, though many are breeding successfully who never go outside of their own pens for new blood. This, however, can only be done when care is taken in the selection. If it is thought best to buy cockerels each year or occasionally, get them, if possible, from the same man from whom the original stock came. The changing of the strain of breeding stock every year tends only to make results uncertain.

HOW TO PROCURE STOCK.

Pure bred stock can be obtained by various methods. The most common is to buy eggs. One can also buy breeding stock. The latest method is to buy day-old chicks. There is still another way which is very common, though not so sure. That is, to buy pure bred males and grade up the flock already on the farm.

Under most conditions, a farmer will find it suitable to buy eggs in the spring. These eggs, however, should be purchased from stock that are good winter layers, hardy, and it is well to have them also adhering to the general breed type. The practice which is often followed of sending to any place for eggs except one's own locality is wrong. The nearer home eggs can be purchased, other things being equal, the better. Breeders of pure bred poultry, however, find a diff-

culty in dealing with neighbors, as the neighbor will bring a setting of mongrel eggs, and expect a setting of pure bred eggs in return. This is not fair, and those who are buying their breeding eggs should pay a legitimate price. Breeding eggs are worth more than market eggs, which is one reason that even farmers should have nothing but pure bred stock. Never, because they are cheap, buy eggs for breeding purposes late in the season.

In a climate such as we have in Quebec, chicks hatched before the middle of May give the best results. Late hatched chicks are seldom worth the trouble it costs to raise them.

The system of buying breeding stock should be more popular than it is. One will have to pay more for a small pen than for a few settings of eggs, but the number of eggs received should more than make up the difference. In buying breeding stock one is able to see what one is getting, and there is more probability of being suited. Breeding stock should be bought in the fall, when there is more to pick from and the prices are reasonable. If left until spring better stock and a more reasonable price can be obtained if taken after the breeding season is over.

The day-old chick method of procuring breeding stock is not practised to any great extent in this country, though the tendency seems to do more of it each year. Where hatching facilities are not at hand, the buying of day-old chicks may be an advantage. One must take into consideration, however, that during the early breeding season, breeders do not always sell day-old chicks from their best pens. Also that every chick received does not mean an adult bird.

The buying of a pure bred male and mating him with the farm stock is probably one of the most popular methods of keeping up a flock. This system, when used for getting pure bred stock, is not to be recommended, as one never knows just when by such a method his flock can be termed pure bred. Where this is practised there are several things that must be considered. Buy nothing but birds of the best constitution. Never be satisfied with a bird lacking vigor. Get a bird of the same breed each year. A good many buy their birds intelligently, but some change breeds every year. They will take a Rock this year, then a Wyandotte, next a Red, and possibly the Red will be followed by a Minorca, Buff Orpington, Langshan or a Game. In fact they never seem to be satisfied if they cannot get a new breed each year. This should be avoided. Better stick to the same breed, and if possible buy from the same source each year. If any selection is being done, one can easily lose the standard that has been attained by introducing a new bird from a different source. In selecting a male bird, intelligent breeders will choose a bird that is strong in the points in which their hens are weak. For instance, if the breed calls for yellow legs and the flock is made up of a number of hens with dark or pale colored legs, it is well to get a male with a pronounced yellow leg, and so on. Where the practice of buying a new male bird each year is followed, the male bird should be taken from the flock as soon as the breeding season is over, and the cockerels disposed of or separated before they become troublesome.

THE SIZE OF THE FLOCK.

Just how many hens should be kept on the farm can be decided only by the farmer himself. There is no doubt, however, that the average flock can be considerably increased to advantage. There are few farms of from 50 to 100 acres where 100 hens might not be profitably kept. From these 100 hens there should be sufficient returns to pay the rent of the farm. A flock of 100 hens should give the average farmer a gross income of \$300.00 without materially increasing the cost of labor.

Yearly Return of \$300.00.—The flock of 100 hens should be composed of 50 pullets and 50 one-year-old hens.

One hundred hens should lay an average of eight dozen eggs a year, and still allow sufficient extra to rear 300 chickens.



FIG. 14.—COLONY HOUSES DRAWN TOGETHER INTO WINTER QUARTERS.

Fifty of the pullets each year would be required to replace half of the flock disposed of as old hens. Also 10 cockerels would be required for breeding purposes. There would thus be for sale each year approximately the following at the estimated price:—

800 dozen Eggs at, say, 15c.	\$120 00
50 Old Hens at 60c.	30 00
10 Cock Birds at 60c.	6 00
50 Pullets, fit for Breeders, at 75c.	37 50
40 Cockerels, fit for Breeders, at 75c.	30 00
150 Chickens, Broilers, and Roasters. at 60c.	90 00
	\$313 50

The \$13.50 would represent losses in hens.

SELECTION FOR CONSTITUTION.

The Male Bird.—Select one that is bright as he runs in the flock; one that is alert, wideawake. On the slightest commotion his head is

up. As he is examined more closely it is seen that his head is a bright color, neck not too long for the breed, and gracefully joined to good, strong shoulders; the back is broad with the width carried well back to the tail. A good oblong body, breast well developed, which is the result of the keel, going well forward. The keel should be long and parallel to the back, the body fairly deep and set on two strong legs, well set apart. The legs should not be coarse, but of fairly fine texture, straight, neither knock-kneed nor bowed, but just long enough to reach the ground.

The whole carriage of the bird should be graceful. As he is picked up the constitution is further indicated in the head. There is a general appearance of brightness, comb and wattles red, with an absence of scalliness. The beak short, slightly curved and strong at the base. There is an absence of the crow head or snaky appearance. The muscles are well developed, and there is no pinched effect to the base of the tail. The keel is straight, long and fairly deep—not so deep, however, that the muscles do not fill in the sides. Throughout there is an absence of coarseness. It is not necessary to have the male very large, in fact many of the most vigorous specimens are only of fair size.

The Female Bird.—The general characteristics that indicate constitution in the male will be present in the female. She will have that bright, alert appearance. As she is noticed in the pen she will be busy scratching for feed, up first in the morning and last to roost at night. If birds of this kind are bred there will be no danger, but the constitution of the flock from year to year will be maintained.

IV. LAYING STOCK.

To get winter eggs one must start before the eggs are expected. Besides good feeding and housing the right kind of a bird is necessary. The more of the following points she possesses the better:—

The Breed.—A hardy breed for a cold climate.

The Strain.—Breed for a purpose from stock that has been bred to lay. It is just as important to select pullets as to select milch cows.

The Age.—Pullets lay more than hens, but to lay early they must be hatched early. Late hatched pullets, no matter what the breed or strain, will not lay in early winter. The hardest months to get eggs in Quebec are from October 15th to January 15th. To get eggs at this time pullets must be hatched early. To get the largest number of eggs from pullets they should be laying by December 1st. Hens as a rule will not begin to lay till February or later.

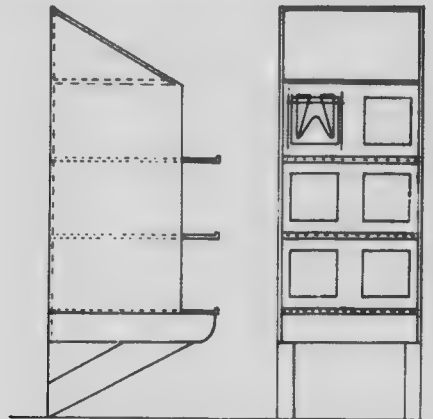


FIG. 15.—TRAP NESTS. STYLE USED AT
MACDONALD COLLEGE.

Health and Vigor.—No matter what kind of stock is kept, it must be kept healthy. Clean houses and fresh air will go a long way towards maintaining health in the flock, if they possess the strong constitution they ought. It is easier to keep a flock healthy than to cure them after they have once developed disease.

Trap Nests.—Trap nests are used to determine how many eggs each hen lays. The trap is so arranged that a hen can enter the nest, but cannot go off until released. Each hen wears a leg band with a number by which she is known.

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There are various makes of trap nests; some are so simple that any person can manufacture them. The style used at Macdonald College is made of spring steel wire No. 9. (Fig. 15.)

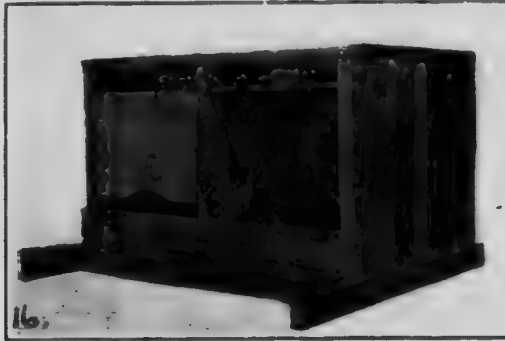


FIG. 16.—TRAP NEST, OPEN AND SHUT. IN USE AT THE INTERNATIONAL EGG-LAYING CONTEST.

Another nest that is even easier made is the one used at the International Egg Laying Contest at Storrs, Conn. (Fig. 16.)

In all these nests the box should be made at least 18 inches from front to back, and 12 inches square in front. They can be placed two or three tiers high, but should have an alighting board in front of each row.

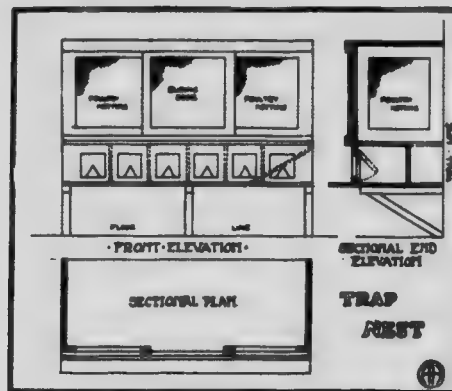


FIG. 17.—COMBINATION TRAP NEST.

A. Farmer's Trap Nest.—Not every person who keeps hens can be bothered with individual trap nests as shown above. These nests require considerable attention, and should be visited at least four or five times a day. To overcome this and yet get a fairly accurate record of what

hens are laying, there has been used at the College a combination trap nest. (Fig. 17.)

Cost of Eggs per Dozen.—In an experiment conducted at Macdonald College last year as to the feed consumed for each dozen of eggs produced, some very interesting figures were obtainable.

A permanent house, 120 feet long by 20 feet wide, was used for the trial. The house is divided into six pens, and a four-foot hall runs the entire length of the north side. The house is a cold house with the exception of the three pens of Leghorns, which are kept at about 40 degrees. In the rest of the house water would freeze almost any day in winter.

The experiment lasted from November 1st to June 1st—seven months. The feed consisted of mixed hard grain thrown in the litter once a day. A hopper of dry bran was before them all the time, also grit, shell and beef scrap. Each pen had a mangel every day, and they had water to drink. A forkful of alfalfa hay was put into the pen every few days. The grain was made up of two parts wheat, two parts whole corn, and one part composed of any mixed grains, usually of oats, barley and buck-wheat. This was fed in a heavy litter about three o'clock in the afternoon.

There was no intention of making a breed test. This incidentally comes out, but should not be taken as meaning very much. Two hundred and ninety birds were put in the house about the first of October. All were pullets excepting pen three, which contained year-old hens.

The whole flock of 290 ate, for the seven months, feed valued at \$127.35. The egg yield was not large, a total of 18,054 eggs, and for the prices at which they were sold brought \$794.96. If the eggs had been sold at 20c. per dozen the flock gave a profit over cost of feed of \$237.12. At the figures received they gave \$667.61.

Table showing Cost of Feed and Eggs, Unit Cost of One Dozen, also Value of Eggs on the Hundred Hen Basis.

Pens.	Breed.	Feed.	Eggs.	Cost per dozen.	*Value of eggs.
1.—60	W. Leghorns	\$21 35	323 dozen.	6.6¢.	\$284.33
2.—60	W. Leghorns	 21 35	243½ dozen.	8.7¢.	215.73
3.—50	W. Leghorns	 21 40	205 dozen.	10.4¢.	227.18
4.—40	R. I. Reds	 20 75	237 dozen.	8.7¢.	309.25
5.—40	W. Wyandottes	.. 19 95	269 dozen.	7.4¢.	317.87
6.—40	B. Rocks	 22 55	227 dozen.	8.2¢.	326.17

*Per 100 hens at actual price received.

Average cost of feed to one dozen eggs, 8.1 cents.

Note.—The difference between pens No. 1 and No. 2 is, No. 1 were well matured, vigorous birds; No. 2 were not as good a lot.

No. 3 were hens, and did not lay as well as Nos. 1 and 2; the eggs were used for breeding, which is reason for more value.

Though No. 6 did not lay as many eggs as some others, their eggs were worth more on account of quality and time of laying.

Broody Hens.—With American or Asiatic breeds the breaking of broody hens is more or less difficult. This question should not, however,

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cause very much trouble if it is dealt with properly. As a rule, the older a hen gets the more she is inclined to brood and the harder she is to break; for this reason if old hens are not kept, the difficulty would to a certain extent be eliminated.

It must be remembered that the longer a hen is allowed to sit on the nest, the harder she is to break; for this reason, as soon as a hen is noticed to be broody, she should be taken off the nest. If she is allowed to remain there overnight even, the work of breaking her will be harder, nor will it do any good to keep her off the nest in the daytime and allow her to sit at night.

Various means are made use of to break broody hens. Some of them are, to say the least, not very kind, others positively cruel. No



FIG. 18.

matter what method is used, the important thing is to deal with the hen in time.

Some hens are so persistent that it is almost impossible to break them, and the best thing is to allow them to incubate or to kill the birds. A swinging coop, as shown in Fig. 18, serves the purpose as well as anything. It is hung from the ceiling and swings in the scratching pen about a foot from the floor. The coop may be made two or three feet square, depending upon the size of the flock. With American breeds it takes from two to three weeks to get them laying again.

One or more broody hens can be put in this "prison"; a gentle swing helps them to forget their troubles, and they go back to work again. While in the coop give plenty of dry feed and water. An ordinary

feeding crate serves the same purpose. A good, vigorous cockerel put in with the hens sometimes helps.

How to Tell the Age of Fowls.—A pullet will show rose-colored veins on the surface of the skin under the wings. There will also be silky hairs growing there. After a year old these hairs will disappear, as do the veins, and the skin grows white and veinless. The difference can be seen at a glance.

A pullet that has not laid will have the pelvic bones almost touching. The bones gradually widen as the fowl continues laying, and at two years old are much further apart than at one year old.

The third point of difference lies in the claws and shanks. In a young bird the skin of the claw is supple, the scales thin and brilliant. The skin gets coarser and stronger and the scales harder as the bird grows, and the nail of the last toe, which does most of the work when the bird scratches, gets worn.

There is also a difference in the eyelids. These acquire wrinkles as the bird gets older, and there is also a slightly shrivelled look on the face. This with age becomes more and more pronounced, as does also the hardness of the bone. In young birds, the bones are comparatively soft, but by the second year they are hard and the end of the keel cannot be bent.

In the case of cocks, above and beyond these points of difference, there are the spurs to judge by.

The safest way is to leg-band the pullets, alternately right and left leg. Then if hens are not kept longer than the second season, there is no difficulty through having useless hens around.

V. FEEDS AND FEEDING.

The question of what to feed and how to feed is not necessarily as complicated as some writers would have one believe. True, there are feeds more suitable than others, but the farmer with the mixed farm who grows any grain at all should not find it difficult to find feed suitable for his poultry.

Food in general may be divided into four classes: grains, green foods, animal foods and grit, shell, etc.

Grains are the principal part of the hen's food. Almost any kind of grain can be fed to advantage where hens are used to eating it, but hens, like anything else, have sometimes to acquire a taste for certain foods. The best one grain for poultry is undoubtedly wheat. Other grains, however, can be fed; and if several varieties can be obtained, it is better to feed a mixture than to feed a single grain. After wheat, corn, oats, buckwheat, peas, and other grains can be used to advantage. Rye, for some reason, never seems to be relished by poultry, though it has practically the same feed value as wheat. Most grains should be fed whole, and during the winter time should be fed in litter.

Green Foods.—Poultry require green food at all times of the year. During the summer this green food is available in the grass, but during the winter it has to be provided in some other form. Roots and vegetables are very convenient where a supply of these are to be had, but if they are not obtainable, green food can be supplied by sprouted grain, oats being the most convenient grain to use for this purpose.

How to Sprout Oats.—Put a pailful of oats in a sack and soak for twelve hours. Hang up for twelve hours and let drain. Then pour the oats into a heap on the floor where they can be left to heat for twelve hours. As soon as they are warm, spread them out on the floor about an inch deep. Sprinkle them with warm water twice a day, and in about a week's time they will present the appearance of miniature field of green grass. They may be turned over or not. The advantage in turning them is that the sprouts are kept tender and the oats appear more as a mass of rooted grain rather than tops. Some prefer leaving them to grow the green top, and when they get to be from two to six inches in height, little chunks 3 or 4 inches square are taken out and thrown into the pens. For young chicks, these shoots can be cut off, and it is astonishing how much green food can be obtained from a few oats.

It is well to remember that the floor where oats are sprouted should have slope enough to drain the water off, and the temperature should be at least above freezing. The floor of the cellar answers very well.

Clover, etc.—Clover hay and alfalfa are also valuable, both as green food and for the protein contained in them. The leaves from the barn floor where the hay drops are very often utilized for this purpose. They

may be fed dry, mixed with mash, or steeped, but no matter how the green food is obtained, fowls must have a supply during the winter months.

Animal Foods.—Animal foods supply the protein which goes to make up the ration required. These foods are given in the shape of milk, gluten, linseed meal, green bone, beef scraps, table scraps, etc. Where small flocks are kept, the scraps from the table, combined with skim milk, may supply all the animal food necessary. Where flocks are large and there is not sufficient refuse, it will be necessary to supply the animal food in some other form. Prepared commercial foods can be used for this purpose.

Grit.—Grit and oyster shell, though not foods, should be before poultry at all times. During the summer sufficient grit may be procur-



FIG. 19.—HOPPER FEEDING GROWING CHICKS.

able from the soil, and the lime from the oyster shells is very often supplied in other materials. There are commercial oyster shells and grits on the market, where a small flock is kept, the same can be procured on many farms without additional cost. Broken crockery, glass, fine gravel and so on can be used as grit. Broken plaster, crushed egg shells, and various other articles will supply the lime required.

SYSTEMS OF FEEDING.

Just how poultry should be fed depends upon local conditions. There are a number of so-called systems of feeding, such as grain in the litter,

dry mash system, the hopper system and the wet mash system, etc. (Fig. 19.)

Wet Mash.—One of the oldest systems of feeding is the wet mash, and it has many friends even to-day. The wet mash may be composed of any ingredients desired, mixed with milk or water, and fed to the poultry in a damp or crumbly condition. Where a small flock of hens is kept, the wet mash gives a convenient medium through which the table scraps may be fed. Where larger flocks are kept, however, the wet mash has gradually been discarded. Mashers are fed both cold and hot, and often have mixed in them condiments of one kind and another. Good results are obtained where the wet mash is never given, and it is asserted that better fertility is obtained where dry grain and dry mash is fed.

Time to Feed Mash.—Where it is convenient to feed wet mashers, the time for feeding may be considered. Some advocate feeding the wet mash in the morning, but this seems to be the most unfavorable time with such severe weather as in Quebec. To allow the birds to fill their crops full of the warm, soft mash the first thing in the morning means that it is not necessary for them to scratch to satisfy their hunger, and since they have taken what mash they wish, they stand around until hunger again compels them to hunt for feed. This, in a cold climate and especially where cold houses are used, is not desirable. Induce the hens to rustle; let them get up a good circulation, and they are not so liable to catch colds. The mash is not suitable to feed at night, as the hen cannot take sufficient of it to keep her going until morning. The most reasonable time seems to be at noon.

Condiments.—Many people, in order to get eggs when they want them, feed their poultry all kinds of spices, red pepper, ginger, venetian red, etc. There is no doubt that the feeding of any stimulating feed tends to bring on a better supply of eggs; but there is a reaction, and the best feeders have practically discontinued its use. Where hens are stimulated for egg production, the fertility during the hatching season is impaired. The constitution of the chick is also weak, and many who have persisted in this method of feeding complain of increasing lack of vigor in their flocks. A good normal feed and plenty of it, fed judiciously, is the best system—the only system that can be followed from year to year and the vitality of the flock maintained.

Condition of Food.—Poultry deserves good food. This does not necessarily mean milling wheat, because shrunken wheat, provided there is no disagreeable flavor, will give just as good results. Grain should never be sour or musty, but shrunken or small kernalled grain may be just as good as the first quality. The practice of feeding hens light oats cannot be too strongly condemned. Oats are not an ideal poultry food. Poultry require a concentrated food. They are not constituted as other stock in that they can assimilate bulky foods. Light oats contain a large proportion of hull and very little kernel, and to expect eggs from feeding light oats is out of the question. Poultry should be fed regularly, and any severe change in the method of feeding should not be adopted too suddenly. This also applies to the water fowls are given to drink. They

should have a constant supply during the summer, and the water before them should always be sweet and pure.

Feeding at Macdonald College.—(Fig. 19a.) At the College there is used a combination of the grain, dry mash and hopper system. During the summer, when the hens are on free range, hoppers are used. A supply of mixed grain or frozen wheat is put into the hoppers. To these hoppers the hens have free access at all times. During the winter, when the hens' liberty is curtailed, the whole grain is taken out of the hoppers and replaced with bran. The grain is then fed in litter 8 to 12 inches deep, once or twice daily, and the hen is compelled to scratch for the grain.

It is often stated that laying hens should never be too fat. It is a question if a laying hen can be too fat. There are more hens that do not lay because they are too thin than because they are too fat. If one expects eggs, the food must be supplied.

The system of feeding used at the College can be adapted by any farm without increasing the amount of labor. In each house is a small bin into which one or two bags of feed can be put at a time. This feed

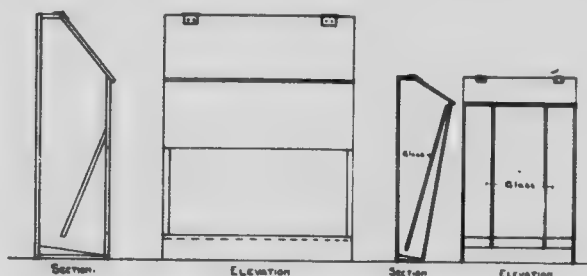


FIG. 19A.—FEED HOPPER USED AT MACDONALD COLLEGE.

is hauled by the horse and this hopper is filled, say, once a month. There is a hopper into which a sack of bran or moulee is put, and a small hopper to hold grit, oyster shell and beef scrap if required. Thus the feed is always in the pen, and it is never necessary to carry feed from the granary before the poultry can be fed.

On winter mornings, a little grain may be thrown into the litter; though as a rule feeding is practised but once a day, from 3 to 4 o'clock in the afternoon. Into the litter on the floor at this time is thrown a mixture of whole grains, usually two parts wheat, two parts corn and one part any other grain or mixture. The hens are very fond of corn, and the large kernels show up readily. They pick up the corn, fill their crops, after which they go to roost with crops full. In the morning they take to the litter again and are busy scratching all day for the wheat and other small grains they have already incorporated in the litter. As the bran is continually before them, there is no possibility of their suffering for want of food. The endeavor should be to have just enough grain in the litter to keep the hens scratching. When the litter becomes too full of grain, food is obtained too easily and the only remedy is to feed less.

In feeding hens, one must know whether they are in condition to lay or not. With American breeds the hen which is not laying is easily overfed. For this reason, hens and pullets do better if separate, and one can feed the pullets a little heavier. The food which, if given to pullets, goes to make eggs, will, if given to hens, make flesh.

If plenty of buttermilk or even skim milk can be supplied, hens will not need much animal food. Green food is usually supplied by mangels. A mangel or a mangel split in two is thrown in and the hens help themselves. Where milk can be obtained it can be given for drinking purpose.

Water has been given either warmed or cold, or no water at all has been given during the winter months. Where plenty of snow is available without causing the fowls too much exposure, it seems to have given just as good results in egg production as water. Where, however, water can be given without too much labor and expense to keep it from freezing, it is just as well to give them water to drink. It may be warmed, because it will then take longer to freeze.

THE BALANCED RATION.

The farmers who grow their own feed need not lose any sleep over what is called the balanced ration. Give the hens a variety of foods and they will likely balance their own ration. Where the feed has to be bought, it is just as well to know the value of certain grains so as to be able to determine which is the cheapest grain to buy. For this purpose, chemists have worked out what is called the balanced ration. For those who are so situated, and for farmers who want to study a little more about the scientific feeding of poultry, we give the following table of foods:—

Feeds and Feeding.

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Table of Poultry Foods.

Food.	Protein.	Carbo- hydrates.	Fat	Nutritive Ratio.
Field Corn	10.4	70.3	5.0	1: 7.9
Sweet Corn	11.6	66.8	8.1	1: 7.5
Gluten Meal	29.4	52.4	6.3	1: 2.3
Gluten Feed	21.3	52.8	2.9	1: 2.7
Wheat	11.9	71.9	2.1	1: 6.3
Wheat Screenings	12.5	65.1	3.0	1: 5.8
Low Grade Flour	10.0	75.0	1.0	1: 7.7
Wheat Bran	15.4	53.9	4.0	1: 4.1
Wheat Middlings	15.6	60.4	4.0	1: 4.7
Dry Bread	6.9	44.2	0.5	1: 6.6
Oats	11.8	59.7	5.0	1: 6.1
Barley	12.4	69.8	1.8	1: 6
Buckwheat	10.0	64.5	2.3	1: 7
Rye	10.6	72.5	1.7	1: 7.2
Millet Seed	12.7	58.0	3.3	1: 5.2
Flax Seed	21.7	19.6	35.6	1: 5
Ground Linseed	21.6	27.9	30.4	1: 4.8
Cotton Seed Meal	42.3	23.6	13.1	1: 1.3
Sunflower Seed	13.0	23.9	23.6	1: 6.3
Clover Hay	12.3	38.1	3.3	1: 3.7
Alfalfa	14.3	42.7	2.2	1: 3.4
Timothy	5.9	45.0	2.5	1: 8.7
Green Grass Clippings	2.3	13.8	1.0	1: 7
Cabbage	2.4	3.9	0.4	1: 2
Beet Tops	1.3	2.3	0.3	1: 2.3
Lettuce	1.0	1.6	0.2	1: 2.1
Spinach	2.1	2.4	0.5	1: 1.7
Peas	22.4	52.6	3.0	1: 2.4
Cow Peas	20.8	55.7	1.4	1: 2.8
Soy Beans	34.0	28.8	16.9	1: 2.1
Tomatoes	1.0	5.8	0.5	1: 7
Pumpkin, Fresh	0.9	3.9	0.1	1: 4.6
Potatoes	2.1	17.3	0.1	1: 8.3
Boiled Potatoes	1.27	18.81	0.1	1: 14.9
Red Beets	1.5	8.0	0.1	1: 5.5
Sugar Beets	1.8	9.8	0.1	1: 5.5
Mangel Wurzels	1.4	5.5	0.2	1: 4.3
Turnips	1.1	6.2	0.2	1: 6
Whole Milk	3.5	4.8	3.7	1: 4
Skim Milk, raised	3.1	4.7	0.8	1: 2
Skim Milk, separated	2.9	5.2	0.3	1: 2
Butter Milk	3.9	4.0	1.0	1: 1.6
Beef Scrap	58.0	...	32.9	1: 1.4
Dried Blood	65.1	5.3	16.3	1: 0.6
Green Bones	22.3	...	16.5	1: 1.8

The following tables show an average nutritive ration suitable to different ages:—

Chicks.		Laying Hens.	
First 2 weeks	1: 4.1	Maintenance Ration, hens..	1: 6.6
2 to 4 "	1: 3.4	Laying Hens	1: 4.4
4 to 8 "	1: 3.5	Molting Ration, hens	1: 4.3
8 to 12 "	1: 4.4	Fleshing Ration	1: 6.8

Mixing a ration.—To tell what nutritive ratio a given combination of foods is, add the three columns of foods included separately, multiply the total fats by $2\frac{1}{2}$, add to the total of the carbohydrates column and divide by the total of the protein column.

VI. INCUBATION.

Hens or Incubators, Which?—It depends upon the number of chicks wanted. Where natural means have given satisfactory results and conditions are unchanged, it may not be necessary to turn to the artificial. If one is sure the old way is cheaper and more satisfactory, stick to it. Where a few old hens are kept for sitting purposes, better results will be obtained from them than from the best of incubators. Whether it pays to keep these old hens around for this purpose can be best decided by the owner. Many a hen used to her job will bring out almost every egg and rear ninety per cent. of the chicks. No incubator will do this. Take, however, from the average flock ten hens and set them on 120 eggs, and the chicks hatched from them will not average more than from 120 eggs in a good incubator. The incubator will give earlier chicks though the hen may produce stronger. Those who are satisfied with one hundred chicks or less will probably get best results from the hen, especially if not particular about having them early and of a uniform age.

Buying an Incubator.—Buy nothing but the best. A good incubator manufactured by a reputable firm should give satisfaction. Incubators that have proved good with one's neighbors should be sufficient guarantee. It does not pay to buy anything because it is cheap. Those who sell are not in the habit of giving something for nothing. The first cost of the outfit is nothing compared with the expense of keeping a poor machine supplied with eggs. Pay a fair price for a good article and there will be less worry and risk and better results. In examining an incubator, see that it is well put together and that it has good insulation; a machine may have the appearance of being well built, yet fail to do the work because it lacks proper insulation.

There are some cheap machines advertised, guaranteed to be as good as the best; but few, if any, of this class give satisfaction. It is well to bear in mind that the guarantee "you will not have to pay if the machine does not give as good satisfaction as any made" is not worth very much. The probabilities are that the note given for the machine will be collected. It is certainly hard to prove that the incubator does not give as good results as other makes. Select a machine made by a reliable firm, but make up your mind that it will have to be paid for. In operating an incubator, it must be remembered that the machine has no brains. If properly handled, it will maintain a fairly uniform heat in a varied temperature, but the brains must be supplied by the operator.

How to Operate.—As a rule, it is best to follow the instructions sent out with the incubator. The manufacturers should know best how to run their own machine.

Any well-ventilated room, free from draughts, will do to run it in; a dry cellar answers probably best of all. Avoid a shaky floor.

INCUBATOR EXPERIMENTS.

A number of experiments have been conducted at Macdonald College, some of which may be of interest.

Room Ventilation.—The room in which the incubator is operated should be well ventilated and not too warm. An even temperature makes it easier to maintain an even degree of heat inside the incubator, but a room at 60 degrees is better than one at 70 degrees or 80 degrees. In this experiment three rooms were used. Room No. 1 had no ventilation, except what it could get as the attendant entered and left the room. Room No. 2 had an electric fan going, and Room No. 3 had the fan going and the windows open. The desire was to ascertain the influence of ventilation, not only in the hatch but in the vitality of the chicks.

The percentage of hatch was: No. 1, 30.8 per cent; No. 2, 59.2 per cent.; No. 3, 61.4 per cent. The vitality of the chicks was: No. 1, 44.5 per cent.; No. 2, 67.6 per cent.; No. 3, 91.0 per cent.; demonstrating most clearly that in order to get the best hatch ventilation of the room is necessary, and also that chicks hatched in a well-ventilated room have more vitality. In this case there was double the number of chicks from the ventilated room.

Coal Oil in the Room.—Not only should the room have an abundance of ventilation, but according to another experiment the coal oil can or barrel had better be kept outside the room in which the incubator is running.

Machines running in the room in which the oil tank was kept and where the lamps were filled gave an average hatch of 49.6 per cent. against an average hatch of 60.1 per cent. in the same kind of a room without the oil. It is not known whether the chicks from the one room lived any better than those from the other, as no records were kept to determine this point.

Size of Incubators.—The question is often asked as to the most suitable size of incubator to buy. This, of course, will largely depend upon the buyer's condition and intentions; and probably where one's operations may expand it is not wise to purchase a machine too small. Larger machines are more economical of oil and labor and, for the egg capacity, usually cheaper.

On the other hand, the ordinary farmers will not have sufficient eggs to fill a large machine, and it is sometimes an advantage to have two small incubators rather than a large one of the same capacity. The eggs can be set fresher and, in case of accident, the eggs are not all in the one basket. For several years the general average hatch of the two sizes has been kept, and the results show that machines with a capacity of over 200 eggs have not given as good results as those with a capacity under 200 eggs, the general comparison being 45.2 per cent. for the large size and 54.1 per cent. for the small.

Cooling and Turning.—A general average result of 10 per cent. more from eggs that were cooled while hatching over those that were not cooled is the result of our experiments. Both were turned twice daily.

Ventilation of Machine.—The experiments on ventilation of the machines are not complete, but indications point to the advisability of keeping the ventilation closed for the first few days or week and opening for the remainder of the hatch. This, of course, is where the room is well ventilated.

Other Experiments.—Much has been said of the advisability of introducing various factors in order to ensure a better hatch of living chicks.

It always pays to thoroughly clean and disinfect the machine after each hatch. For this purpose, any good disinfectant seems to answer.

The introduction of carbonic acid gas, applied either by a yeast or "Kipps" apparatus, has not improved the results.

A smelling salt one season gave good results, but the following year the opposite results were obtained.

Electric machines and electricity used as the heating force on ordinary lamp machines have given no better results than the lamps, and are not so economical.

Brandy and warm water introduced into the machine as the chicks were pipping proved a failure, as did a number of other concoctions. The addition of moisture has helped.

ESSENTIALS FOR A GOOD HATCH.

1. Healthy Laying Stock.—This is of prime importance; stock that has not been forced or pampered, preferably kept in cold houses.

2. Strong Fertility.—Not only fertile eggs but strong germs can be secured only with healthy birds properly mated. Have one vigorous male bird for every eight or ten hens.

For causes of lack of fertility, look for unhealthy stock, lice, forced feeding, too many hens to the male, too many males, chilling and rough handling of the eggs, abnormal eggs, etc.

3. Proper Handling of the Incubator.—No matter how good the incubator, if the eggs are not good the results will be disappointing. If, however, these are present, a good incubator run according to directions and common sense should give satisfactory results.

Testing.—Testing the eggs twice during the hatch is sufficient. Make the first test for fertility from the 5th to the 9th day; the second test for dead germs about the 16th day. A hole in a wooden shutter is used when done by daylight. If done after dark, an ordinary wooden box with a lamp inside is often used, but any of the ordinary testers supplied with the machine answers very well.

An amateur can learn more about testing by doing it than in any other way. Do not be afraid to break open some of the discarded eggs. When one is not sure of a germ, it may pay to break it open and know. Even an egg with a live germ may be profitably broken. It is the only way to know just what is seen from the outside. Compare the live and the dead, the fertile and the unfertile from without and from within.

NATURAL INCUBATION.

Where to Set a Hen.—A large number still stick to the old hen. This system can be made easier if proper methods are adopted.

Never allow a hen to sit in the same house in which the other hens are laying. Either pen off a portion or have a small house to use for that purpose. Good results with very little labor can be obtained by

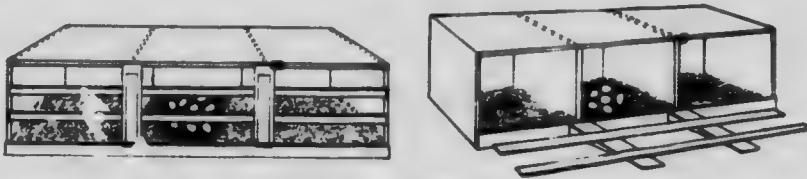


FIG. 20.—A SUITABLE ARRANGEMENT FOR SITTING HENS.

using the following method. One of the colony houses or part of the feeding house is utilized. For nests, use the box shown in the illustration. (Fig. 20.) It is made of a 12-inch board, cut in three equal lengths. One 4-foot piece is used for the top, one for the back and one for the bottom of the box. The partitions are made of the same material cut in 1-foot lengths. Along the front is a 4-inch strip to keep in the litter, and a slatted door is hinged on the front so that when it is opened it forms a platform to the front of the nest.

The Nest.—The nest is made of a piece of sod or other litter. The boxes can be placed on the floor along one wall; and if many are used they may be piled one on top of another. Before the hens are set the room is disinfected, whole grain is put in for feed, a pan for water and a dust bath.



FIG. 21.—COOP FOR HEN AND CHICKENS, AS USED AT O. A. C.

At night the broody hens are transferred to these nests. They are sulphured for lice and left a day or two sitting on dummy eggs. As soon as it is evident that they mean business, good eggs are put under, 13 to 15 to each hen, according to her size.

The work to look after 30 to 40 hens sitting in this place is less than half an hour a day. Once a day the attendant goes into the house and turns the hens out of the nests and shuts the doors so that none can

get the nests. Thus the hens are compelled to remain on the floor until they have had a chance to feed, drink and dust. Then the doors are all opened and they are allowed to return to the nests. Of course they will not return to the nest from which they got off. A better average hatch can be obtained if they change nests. Hens are not always of the same temperature, and the changing of nests gives a more uniform temperature throughout. Nor is it possible to put off each hen with the chicks from the eggs she started out with. Hens that are getting thin or restless are allowed on the eggs due to hatch first; the good sitters that have kept in good flesh are allowed to remain for weeks, or as long as they appear to enjoy it.

The eggs are tested during the first 7 or 8 days and, when possible, the fertile eggs from three hens are put under two. When the chicks hatch they are again doubled up, the aim being to give 20 to 25 chicks to each hen. (See Fig. 21.)

VII. BROODING AND REARING.

Natural Brooding.—Brooding with the hen need not be troublesome if not too many chicks are required and proper appliances are provided.

In taking the hens off the nests, the aim is to give about 25 chicks to each hen. If more than one hen comes off at a time and there is a laying colony house available, four hens and 100 chicks can be put in one of these houses. A little opening is left for the chicks to run out when large enough, and there is ample room for them to scratch on the floor on wet days. If the hens are all put in the house at the same time, there does not appear to be any serious trouble from fighting.



FIG. 22.—DETACHABLE HAVENS ARRANGED IN A HOUSE.

As soon as the hens can be removed they are put back into the laying house and the chicks are given the house for the summer. The A-shaped house is also used much for the same purpose, except that two hens and 50 chicks are put in one of these.

Small coops for individual broods are also used, some of which are illustrated. These are made without bottoms and each coop is moved the width of itself each day.

Artificial Brooding.—(See Fig. 22.) The brooding of incubator chicks seems to give more or less trouble. There does not seem to be as

much difficulty in hatching as in rearing. To overcome this, some hatch the chicks in the machine and brood by hens; others the opposite. In order to have good results from artificial brooding of chicks several things are necessary.

First, the chicks must inherit a strong constitution; if the parent stock is weak the chicks cannot help it. There is no doubt that a good sitting hen will hatch fairly good chicks from parent stock which may not be of the best; but to get good results from an incubator the constitution of the parent stock is essential. Breeding stock housed in cold houses, not forced or fed stimulating food, will give chicks that are comparatively easy to raise in the brooder.

Second, the incubator may have something to do with the vitality of the chicks. If the temperature has been extremely high or low, bad results



FIG. 23.—COLONY HOUSE ADAPTED TO BROODERS
FOR INCUBATOR CHICKS.

may follow. The humidity of the machine also has an influence. Allowing the chicks to drop into the nursery drawer sometimes means death to the chicks later on. The nursery drawer is all right for dry chickens, but to allow a chick just out of the shell to drop from a temperature of 105 to 95 degrees can have only disastrous results. Keep the drop to the nursery drawer closed. Open the machine and take out the dry chicks and put them below. Transferring of the chicks from the incubator to the brooder is sometimes the means of a great deal of mortality; the brooder should be only a few degrees lower than the incubator and the chicks should be put into the brooder without being subject to a draught.

Third, conditions of the brooder must be right. It should be from 95 degrees to 100 degrees beneath the hover when the chicks are put in, perfectly clean and disinfected. Many brooders are death traps in that they have so many hot corners into which the chicks crowd. Many are

so inconveniently made that it is next to impossible to thoroughly clean them and there seems to be very little arrangement made for proper ventilation.

Fourth, the feeding of the chick is important. More chicks are killed from too much feeding during the first two weeks than from too little feeding. Don't feed the chicks for at least 24 hours after they are put into the brooder. Dry feed will give less trouble than wet mash. If these points are carefully studied there should be no reason why the death rate in young chicks should be so large.

Different Types of Brooders.—No one company makes all the good brooders, but as a rule the indoor brooder gives better results than the outdoor brooder. (Fig. 23.) The outdoor brooders have not sufficient space for the chicks during the unfavorable weather, nor do they provide accommodation for the chicks for a long enough period. The indoor brooder can be placed inside an outhouse or colony house. The house gives protection for the chicks during the wet weather and the same house can be used for rearing the chicks afterwards.

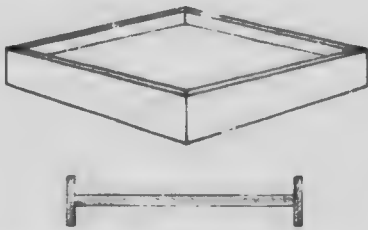


FIG. 24.—FEED TROUGH FOR SMALL CHICKS.



FIG. 25.—HANDY FEED CAGE FOR CHICKS.

For indoor brooders small round hovers give good results. They can be put into any sort of house and the arrangement of the lamp on the outside makes it very convenient for the attendant. In the small "A" house (Fig. 7), one of these brooders is filled with about 50 chicks. The larger house, the size used for laying hens, will take 3 or 4 of these hovers and accommodate from 150 to 200 chicks. With this house, the same as with the A-shaped house, the brooders are removed just as soon as the chicks are able to look after themselves.

Feeding and Care.—The feeding of chicks in the brooder is often the cause of trouble. So many people, especially amateurs, like to see the dear little things eat that they feed them until stomach troubles are the result. Feed should not be given sooner than 24 hours after they are put into the brooder. The first feed is rolled oats and cracked wheat. Four or five feeds of this a day is given for the first week, after which the rolled oats is gradually discontinued and the cracked wheat along with the other cracked grain takes its place. The grain is first sprinkled on a clean board, later in the litter, and the young chicks are encouraged to scratch for all their feed. Where one has no facilities for cracking grain, prepared foods can be fed to advantage. Water and grit are sup-

Farm Poultry.

plied the chicks as well as green food if they are not running on the grass.

By the time the chick is four weeks old it is eating practically nothing but cracked corn and whole wheat, and this feed is continued throughout its rearing period.

Though the brooder should be warm, the house in which it is placed can be comparatively cold, and the sooner the chicks get on to fresh soil the better. Chick diseases of one kind and another can be prevented and in some cases cured by allowing the chicks out. The chicks, both during their brooding and rearing periods, should be allowed plenty of fresh air. The brooder that will supply this should by all means be selected.

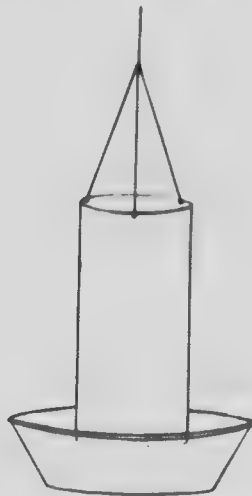


FIG. 26.—FEED HOPPER
MADE FROM A STOVE-
PIPE AND MILK PAN.

Rearing.— The growing of chicks has by many been made a laborious task. There is, however, no reason why chicks should not be reared with very little trouble. The system adopted here makes it possible for a flock of chicks to be successfully grown with attention of a few minutes a day. When the chick is from 4 to 8 weeks old (it depends upon the time of the year), they are fed in small hoppers. As they get bigger the larger hoppers are used and coarser grains fed. It must be remembered, however, that hoppers cannot be used for small chicks until they have a good range; but just as soon as they are permitted to run, the hopper system can be used without any ill effect. Feed the same kind of grain they will get when they come into the laying house in the fall. It is a mistake to feed chicks grain that cannot be obtained in larger quantities at reasonable prices for the laying hens later. Soft mashes are not used. Probably a mash will bring the chicken along more quickly than a dry

grain, but for breeding purposes a dry grain method will produce better chicks and more of them. For early broilers or for cockerels intended for market purposes the mash will give the best results, but the feeding of dry grain in hoppers will cut down the labor to the minimum.

The housing of growing chicks in the movable colony houses has the advantage that the chicks can be placed on new ground at any time. The placing of these houses in an orchard along a root or corn field gives ideal conditions to the chicks. This year a number were placed in the Horticultural grounds, running in the cabbage the potatoes and the



FIG. 27.—COLONY HOUSES WITH GROWING CHICKS PLACED ALONG THE HEADLAND OF AN ORCHARD.

raspberries. From all indications no harm was done to the crops, not even to the raspberries. It was certainly an ideal range for the chicks and there is no doubt that the insects they gathered was an advantage to the orchard and crops.

A number of photographs given show in what various places these colony houses can be placed. (Figs. 3, 7 and 27.) Where large numbers of chicks are kept it is a good plan to separate the younger from the older and, where possible, when the chicks get 3 or 4 months old to separate the pullets from the cockerels.

VIII. MARKETS AND MARKETING.

The Province of Quebec has one of the best markets in Canada. The City of Montreal will, every year, take more poultry and eggs than the Province can supply.

Still Montreal dealers claim that the best poultry and eggs do not come from their own Province. This should not be. The farmer in Quebec is closer to this market, and the conditions are such that he should produce the very best.

Marketing the Weak Spot.—Poultrymen know better how to produce than to market. For proof one may visit any market in Montreal and he will find that at least seventy-five per cent. of all the poultry and eggs offered for sale exhibit a carelessness that no other business could stand. Good farmers, who follow a systematic crop rotation, who conserve all the available moisture, who never market a bullock except in a finished condition, seem to forget all their business principles when poultry and eggs are disposed of and think the only way to get rid of them is the quickest and easiest way possible.

Probably more than ninety per cent. of all the eggs marketed come from the farm, and to the same source we must look for future developments. There are very few exclusive poultry plants and the past experiences have not been encouraging to this system.

Good Prospects.—The prospects of a good poultry department on the farm are bright. The demand for good stuff is steadily increasing and with it the price. Fifteen years ago one cent an egg was considered a good price, and farmers occasionally sold eggs for six and eight cents a dozen; dressed poultry brought from twenty-five to thirty cents a pair, or four to eight cents a pound. Now, eggs seldom go lower than 15c. a dozen to the farmer, and they range from this up to, in early winter for strictly new lays, anything one has the conscience to ask. Dressed poultry sells for from twelve to twenty cents per pound and in some cases much higher. During the past thirty years, on the Bonsecours Market, Montreal, ordinary farm produce has advanced 20 per cent., hogs 50 per cent., and poultry 100 per cent. There seem to be few industries that promise better prospects to the farmer than the poultry, and still few farmers have the up-to-date poultry department that they might. Little care is taken of the flock and less in putting the product on to the market.

Probably nine-tenths of all the eggs produced find their way to the market through what is called the "system." The peddler or country store is the first handler; there is no encouragement to be careful, for the same price is paid for all, good and bad. Not until the eggs reach the wholesaler are they candled, and they are then from two to four weeks old. In a summary of replies received from Canadian dealers last year, it was found that during the summer months the eggs that arrived contained less than fifteen per cent. strictly new laid, the other eighty-five

per cent. ranging anywhere from stale to rotten. The new-laid were mostly from co-operative circles of private shippers. Of course, in addition to this must be counted the guaranteed eggs shipped direct from producer to consumer, which is yearly increasing.

Conditions in the dressed poultry trade are a little better; only a small percentage of that which is marketed is really first-class, though, as is the case with eggs, the percentage is growing larger each year. In some cases the producer ships direct to the dealer but ships his birds unfattened. In many cases they are bought by a middleman on a commission basis; as a result the quality is not good and there is absolutely no grading. This system, or rather lack of system, in selling means a lower net return to the shipper because of the poorer quality and the numerous commissions.

All Lose on Bad Produce.—Poultry producers should not rest until a better state of affairs is brought about. They cannot afford to have any bad stuff marketed. Every 30-dozen case of eggs that goes into Montreal has three dozen bad—a total loss. Many of the others are far from good.

The producer loses on this because:

1. The price of these is taken out of the amount paid to the producer.
2. Already they have cost for handling, candling, commission and transportation. The producer and the consumer pay for this.
3. These partly bad eggs are retailed and the producer again loses by decreased consumption.

Every off-flavored egg put on to the consumer's table hurts the market. Not a package of eggs or dressed poultry is offered for sale but either helps or hurts the selling price.

It is quite probable that many a chicken dinner has been changed to beef because of the way these products are exposed for sale. The producer is first responsible for this. He sends his stuff in any condition. If he could only see how it arrives it would open his eyes.

It is up to the farmers to remedy this and then there would not be the disgraceful state of affairs that one can witness in some of our markets and stores.

Pre-aring Produce for Market.—From the inquiries that are being received in reference to getting the chicks ready for market, one would imagine that more attention will be paid to the getting ready process. Anyone who thinks this may not be needed had better visit the market of his nearest town or city. If he can go home and have a keener relish for poultry and eggs the market is different from the one visited recently.

There was hardly a bird, young or old, on the market that could not by a very little attention have been improved, at least, in appearance. Chickens were there in dirty crates, chickens of all colors and sizes. There were old hens that were lousy, hens with scaly legs and some that looked as if they might die before the axe came. There was not a live bird in the lot that one could relish on the table after seeing them as they were. Nor were the dressed birds much better. They lacked that neatness and finish that makes one wish he was carving it for his dinner. Many

Farm Poultry.

were thin, and those that were fairly well fleshed were poorly plucked. The skin was torn or blotched from scalding, some were bled, some had lost their heads and some had their necks dislocated. (Fig. 28.)

The outside of the egg shells was better. As far as looks went they were ahead of the poultry, but there were cases that if they had to undergo inspection would have certainly been placed in the third or fourth grade—eggs that if the seller had only been a little less grasping and looked further ahead might have been made more valuable. By keeping out the dirty and small eggs a better grade might have been made. Such people are doing the poultry trade much harm, and they are so short-sighted that they cannot see that they are participating in the loss.

One of the merchants said that the class of produce was gradually getting better, but there was still so much bad stuff offered that the prices to the producer were necessarily low. He also said that though he tried to be fair with every shipper, there were those who thought



FIG. 28.—BOUGHT ON THE MARKET.

they were being cheated. Small shippers would send in a crate of live birds, and along with them the weight and number. When he weighed the lot, he would find the weight far from correct, nor could he satisfactorily explain to the customer that the birds lost so much in transit. So much poor stuff comes in alive that nothing could be made on it, and he thought that some educational campaign should be carried on to show producers what was fit for market and what should be kept at home.

If all the dressed poultry and eggs that went into the market were of an appetizing appearance and of good quality, the producer would get a better price, and the consumer would be willing to pay for something he could enjoy eating. It is a good object lesson for the producer to see what his produce looks like just before it goes into the consumer's hands. If he did, he would sometimes wonder how it brings as big a price as it does.

Warm weather and long hauls coupled with rough handling in transit, all have a share in depreciating the appearance, but it must be borne in mind that produce never arrives on the market in better shape than it leaves the shipper.

Why intelligent farmers will persist in selling their poultry and eggs in anything but the best condition is hard to explain. Since eggs have been eggs, they have been doubtless used more or less as a sort of currency, counted out by the dozen, one egg just as good for food as its neighbor, a new laid of no more value in the eye of the corner grocer than one well on to the broiler stage. Possibly such conditions



FIG. 29.—A CASE OF POULTRY ATTRACTIVELY PACKED.

could not help but create a carelessness that has left the trade in its present state.

There is, however, no reason for leaving it there. The honest seller should get a bigger price for his good quality than the neighbor who is willing to dump anything on the market.

Remedy for Poor Marketing.—Farmers have the remedy in their own hands. Discontinue to sell poor stuff, and sell only to the man who will give a price consistent with the quality.

Farmers seldom have sufficient quantities of their own, and cannot cater to the best all-year-round market, but if they would co-operate with one another this difficulty would soon be overcome.

It has been said that Canada is too sparsely settled a country to develop co-operation, and that the Canadian is too independent to co-operate. Both statements have been proved false, and all that is needed is that the country or the man who has already shown what united

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effort will do in the dairy and fruit trades, will put the same principles into the poultry industry. This is being done in many places.



FIG. 30.—PUT YOUR OWN BRAND ON ALL SHIPMENTS THAT YOU ARE NOT ASHAMED OF.

Poultry Packages.—A neat, attractive package is a good investment. First appearances go a long way in determining the value of eggs and dressed poultry. The person who will take the trouble to make



FIG. 31.—FATTENING SHED AT MACDONALD COLLEGE, WITH FATTENING CRATE IN FOREGROUND.

a neat box or crate and have it tastily addressed and marked will in all likelihood have something good to put into it.

Any amount of really good produce is sold for less than it is worth, because it is packed in unattractive packages. Eggs require clean fillers

and excelsior packing top and bottom. Chickens require clean paper that gives an attractive appearance. There should be uniformity in color and size, contents and packages.

Crate Feeding.—No poultry intended for eating should be marketed without being fleshed. The easiest way to do this is by crate feeding, the advantages of which are recognized by the dealer and the consumer, in that better prices are offered for them. The work entailed is not more than in any other system, and it is the last few weeks of fattening that pay the farmer best.

How the Crate is Made.—The fattening crates in use at Macdonald College are 3 feet long, 16 inches wide, and 20 inches high, inside measurements. Each crate is divided by two tight wooden partitions into three compartments, and each compartment holds four chickens. The frame pieces are 2 inches wide by $\frac{1}{4}$ inch thick. This frame is covered with slats. The slats are placed lengthwise on three sides, bottom, back and top, and up and down in the front. The slats for the bottom are $\frac{3}{4}$ inch wide by $\frac{3}{8}$ inch thick; the back, top and front slats are the same width, but only $\frac{3}{8}$ inch thick. The spaces between the slats in front are two inches wide to enable the chickens to feed from the trough. The bottom slats are put on $1\frac{1}{2}$ inches apart; the slat nearest the back of the crate is $2\frac{1}{4}$ inches from the corner of the frame, to prevent the chickens' feet from being bruised when the crate is placed on the ground. The top slats are 2 inches apart, and the back slats $1\frac{1}{2}$ inches. The top slats are cut above each partition, and six strips, 2 inches wide, are nailed under them. The three doors so formed are hinged to the rear corner piece.

The crates are placed on stands 16 inches from the ground. The droppings from the chickens are received on sand or some other absorbent material. A light "V" trough, $2\frac{1}{2}$ inches inside, is placed in front of each crate. The bottom of the trough is 4 inches above the floor, and the upper inside edge is 2 inches from the crate. (See Fig. 31.)

Crate Feeding.—A satisfactory feed is one that is palatable, not too dear, and will produce flesh. Ground oats, ground corn, ground buckwheat, ground barley and low-grade flour are suitable. Almost any good grain a farmer has will answer.

The ground meal should be mixed to a thin porridge with thick sour skim-milk or buttermilk. On the average 10 pounds of meal require from 15 to 17 pounds of sour skim milk. A small quantity of salt should be added to the mash.

When sufficient skim milk or buttermilk cannot be obtained for mixing the mashes, a quantity of animal and raw vegetable food should be added.

The chickens should remain in the fattening crates from ten to thirty days. Some chickens will fatten more readily than others. These should be picked out a week before the rest of the lot are finished.

It is necessary to feed the chickens lightly the first week they are in the crates. A small quantity of the fattening ration should be spread along the troughs, and as this is eaten up, more should be given, but not as much as the chickens will consume. The food should be given

three times a day; and after feeding, the troughs should be cleaned out and turned over. The chickens in warm weather should receive water once a day, and grit two or three times during the week.

After the first week the chickens should be given twice or three times a day as much food as they will eat. Half an hour after feeding, the troughs should be cleaned and turned over. Water and grit should also be supplied as during the first week.

Starving.—The chickens should be starved twenty-four hours before killing. This will prevent the food remaining in the crop and intestines, which would decompose and spoil the flavor of the birds. Several hours after the last feed allow the chickens what water they wish to drink. They should then have a complete fast until they are killed.

Killing.—No doubt the best way to kill is by bleeding. Though the dislocation of the neck may be used for home use or immediate consumption, all birds marketed should be bled.

The following description by P. T. Woods tells the manner of bleeding poultry for market:

"Grasp the neck of the fowl with the thumb and forefinger of the left hand. Draw the head gently downward, stretching the neck until the fingers strike the angle of the jaw, forcing the fowl's mouth open without choking it. The knife is first introduced into the mouth with the back of the blade against the upper bill, sliding it back until well into the throat. Then turn the blade, and with a quick upward and downward sliding motion, cut the big blood vessels, first on the one side and then on the other, endeavoring to cut against the backbone and skull so as to cut as little as possible into the tissues of the neck.

"A clean, sharp cut of each vein and artery will be followed by free and rapid bleeding. A ragged cut, or cut deep into the tissues of the neck tends to check the free bleeding, and also results in an accumulation of blood clots in the neck, which give an unsightly appearance to the finished carcass. When bleeding is freely established, hold the knife at an angle with the bird's bill, pointing toward the back part of the roof of the mouth in a line with the eye. Now with a rapid movement drive the knife through the roof of the mouth into the base of the skull near the point where it joins the spinal column. When you feel the knife point enter the bony tissue, give a quick half turn to the blade. This causes paralysis, renders the bird insensible, and for all practical purposes, instantaneous death results. Too much or too little of the sticking or braining process will fail to loosen the feathers.

"If the stick has been properly made, there will be a convulsive shudder and throwing back of the wings."

IX. CO-OPERATION.

For the benefit of those who wish to co-operate, we give the suggestions published by the Poultry Producers' Association of Canada. These are intended for branches, but can be applied to any co-operative circle.

1. **Preparatory.**—Interest may be awakened in the minds of farmers in the district who have poultry products to dispose of, by bringing before them the advantages of combinations in marketing. This educational work may require a little time. Where cheese or butter factories are running the poultry work might be added.

When it is found that conditions are favorable in so far as local supplies are concerned, a meeting of all interested should be called.

2. **Area.**—The area to be covered by the branch is very important, as it involves the question of collection. It may not be wise to cover too large an area the first year, but gradually enlarge as conditions favor.

3. **The System Adopted.**—The first object is to get the produce together in the best possible condition with the least expense; where convenient, it might be best to have the members bring their own produce to the shipping point. If this is not practicable it will be the duty of the manager to see that it is collected at stated intervals.

4. **Central Station.**—The central point to which all produce of the branch comes should have convenient shipping facilities. It should have as equipment, testing room, grading table, reasonable storage room, etc. Eggs should be graded as soon as received, and shipped at once. Delay means loss. The cheese factory or butter factory may be central, and convenient for this purpose.

5. **Officers.**—It is well for each branch to have a list of officers, including president, vice-president, secretary-treasurer, and committee. The most important is the secretary, who might also be termed the manager, or it may in some instances be thought best to divide the duties of secretary and manager; the secretary should have good business ability and be prompt in handling correspondence and accounts. The duties are not so onerous as important. The manager is the most important position of the branch, and upon him depends largely the success or failure of the branch. He should have the respect and confidence of the community and be full of activity. Business does not come for the waiting. The question of remuneration will have to be decided by the local branch, and should receive careful consideration. Probably the best plan is to pay a percentage, as the whole time of the manager may not be required at first.

6. **Collection.**—Where co-operation of this nature has existed, each member is expected to send in all suitable produce to the station for one year in order to make arrangements for a regular supply. Eggs must also be delivered to the collector or station two or three times a

week, as requested. Care must be exercised that the area is not too large without a sufficient quantity of supplying members or the cost of the collection may be too heavy.

7. Marketing.—Eggs or cases of dressed poultry should be marked so they can be traced to the producer. A small rubber stamp, costing a few cents, will be provided each producer. This stamp will indicate the branch and also the individual number. These may be had from the association at cost price. The output of the branch must bear the brand of the society. The society has the right to withhold the use of the brand in case of any infraction of the rules.

RULES FOR MEMBERS OF BRANCHES.

1.—Each member should bear in mind that the aim of the association is not only to get better prices, but to raise the standard of poultry produce and to make the trade mark an absolute assurance of quality.

2.—All produce of a circle must be shipped through the central depot, and the packages must bear the trade mark, grade and number of the branch.

3.—The manager is responsible for the output of the circle. He must see that all grades are properly marked and that all members get full value for produce offered. In case of a buyer's complaint against a branch, the manager must be able to trace the misdemeanor to the member.

4.—Members must abide by the manager's rating of the produce, and adhere to all by-laws of the local branch. Shut up or otherwise dispose of all male birds except from Jan. 1 to June 15, offer for sale no eggs except those laid by his own hens and what may be contained under the two grades mentioned; this excludes eggs that may have been found under setting hens, in fact, all eggs that cannot be guaranteed as absolutely fresh.

5.—None but artificial eggs must be used for nest eggs. Eggs must be gathered at least once, and in warm weather twice every day, and must be stored in a clean room, free from any deteriorating influences, of a temperature not to exceed sixty degrees.

6.—Eggs must be delivered to the collector or brought to the central depot as often as requested by the manager. No eggs on hand, but not delivered at any collection, shall be offered at the next collection.

7.—No birds shall be offered for sale that show signs of having been diseased or are known to have been diseased.

GRADES OF POULTRY.

Selects.—To consist of specially fattened birds, crate fed for at least three weeks, extra well fleshed and of superior finish and appearance, unbroken skin, without blemish, straight breast bone, and neatly packed in packages that hold one dozen birds. Each package shall include birds of a uniform size, sex, and color of flesh and legs.

No. 1.— To consist of well-fleshed birds of neat appearance. Packed in neat boxes holding one dozen birds of uniform size, sex, and weights.

No. 2.— To consist of fairly-fleshed birds packed in neat boxes.

Common.—To consist of any birds not conforming to the requirements of the above three grades, but must not be packed in boxes similar to the other grades.

GRADES OF EGGS.

Grading.—It must be remembered that all eggs must be shipped new laid. A new-laid egg is an egg that is not over five days old when shipped, an egg that has been gathered promptly and kept in a moderately dry, cool place (under 60 degrees), free from foul odors and other contaminating influences. On holding a new-laid egg to the light it will be seen that the air space in the large end is very small, not larger than a five cent piece, and the yolk almost invisible. As the age continues the air space enlarges, and the yolk becomes visible.

Rough shelled and abnormal eggs should never be shipped. Though some markets may call for several grades of eggs, as a general rule there is no necessity for many grades. What the best trade demands is freshness, grading, uniformity in packing, and regularity in supply.

For ordinary purposes two grades of eggs will be found sufficient to satisfy the demand made on the producer—New-laid Selects and No. 1. Another grade of common stock may for a time be marketed, but they must not be sold under the brand of the association.

New-laid Selects.—To consist of strictly new-laid eggs, not over five days old, weighing not less than 24 oz. to the dozen. Clean and unwashed, of uniform size and color, packed in substantial, neat cases, having clean fillers.

No. 1.—To consist of new-laid eggs, not over five days old in the summer time or ten days in the winter time, weighing not less than 21 ozs. to the dozen. Clean, packed in substantial and neat cases with clean fillers.

NOTE.—Common eggs, not covered by the foregoing grading, must not be marketed under the brand of this association.

X. INSECTS AND DISEASES.

Prevention Better than Cure.—Practical poultrymen of long experience and students of poultry pathology are agreed that in general it does not pay to "doctor" poultry. There are several reasons. The value of the individual specimens in egg and meat producing flocks is so small that if a man's time is worth anything at all, it is too valuable to be spent in treating sick chickens individually. The very fact that a chicken succumbs to conditions others withstand show that it is not a bird of the best constitution and vigor. Should one succeed in curing a sick bird, it is liable to be forgotten and to be put into the breeding pen, with the result that it perpetuates in its offspring the same lack of constitution that caused it to succumb. Prof. Robinson put this very aptly when he said in regard to roup, "I have cured many cases, but quit treating them years ago, because I found that so long as I cured roup I had more roup to cure." This is practically true of all serious diseases. Those of long experience unite in saying that there is but one safe and sure cure for all serious diseases, and that is the axe.

Poultry keepers must make every effort to keep their flocks from becoming sick. Spend time in nailing up those little cracks and knot-holes through which the draughts come, seeing that the houses have sufficient fresh air and sunlight, that the water vessels are clean, and that the food troughs are not encrusted with the sour and mouldy leavings of last week's mashes.

The facts involved in keeping our poultry healthy are: first, a good constitution; this is imperative. Second, the system of housing, feeding, etc., must be hygienic. In previous paragraphs it has been stated how to choose the birds with good constitution and also how to house and feed.

As a clean hen house is one of the essentials, we may be well to mention how to clean a house. First, take the broom and sweep everything in the way of dirt, etc., on to the floor. Then clean out the floor with shovel and broom. Next, get some water and an old broom and scrub everything in sight. When this is done, the place is mechanically clean, but this is not enough. Take the spray pump and give everything a good dose of some disinfectant. Two to five per cent. carbolic acid or prepared disinfectant may be used. It is not contended that the house should have such a thorough cleaning every time the dirt is removed, but a rigorous cleaning such as outlined above once or twice a year is very necessary.

Preventive Remedies.—While it is not considered good practice to treat individual fowls, it is very profitable to treat flocks as a whole.

One of the best remedies to keep a flock in good health is to put a little permanganate of potash into the drinking water. Put in just enough to color the water. This is a harmless but good antiseptic, and

If one sick fowl happens to escape your notice, the whole flock is not infected through the drinking water.

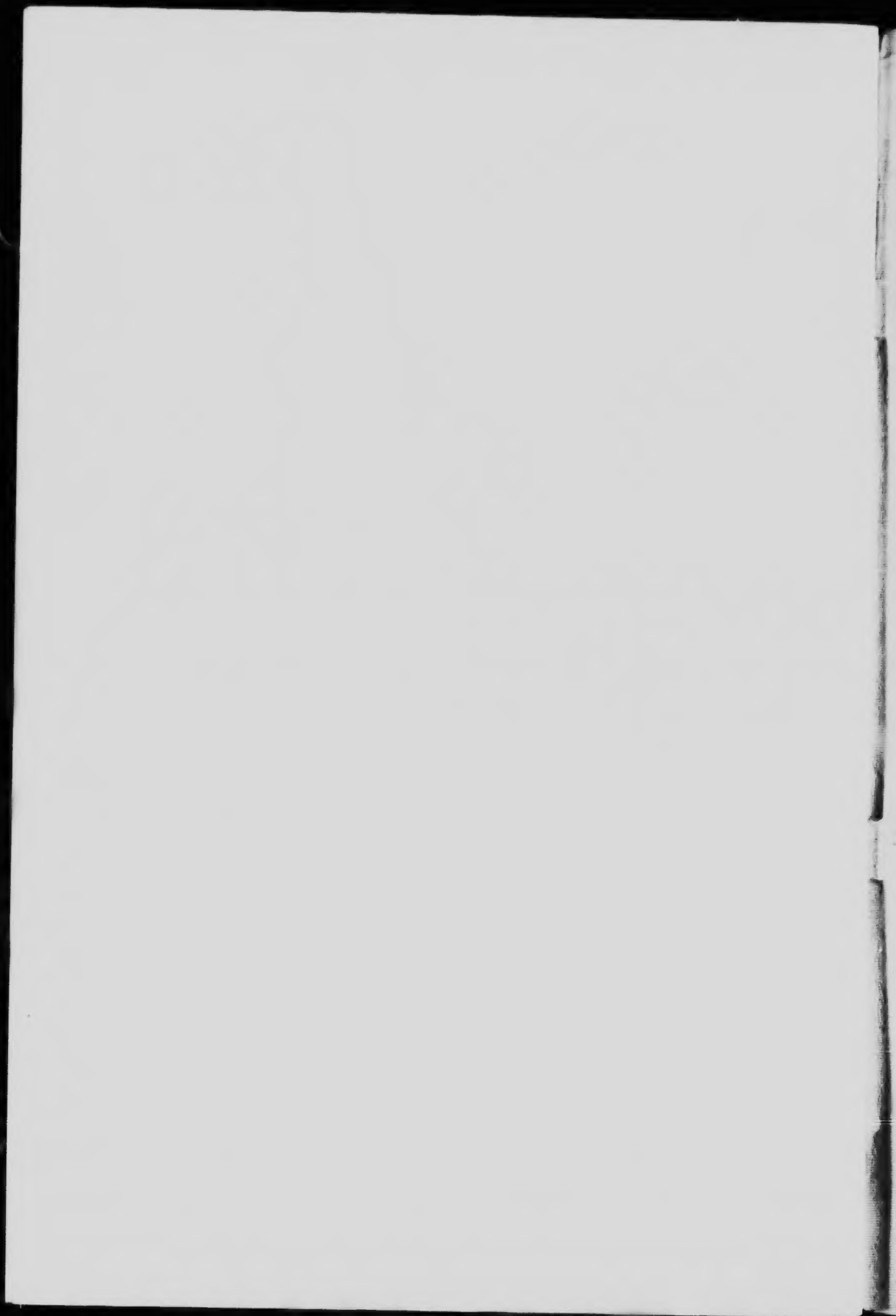
Epsom salts is a good remedy. It is simple, cheap, and very effective in the poultry yard. Liver disease, diarrhoea, and many other complaints respond to this treatment. It is a good thing to give when the flock seems to be off feed after you have located the fault in the ration and remedied that. One-half a teaspoonful is the customary dose for a full-grown fowl, or one pound to a hundred hens. It is generally given in a mash.

There are two ways in which we can diagnose disease in poultry—by their appearance while living, and by post-mortem examination.

When a hen sits around quiet and does not move unless disturbed, pulls her head down towards her body and humps up with ruffled feathers, one can look for symptoms of disease. The eyes become almost or entirely closed. The comb and wattles become very pale, yellow, or sometimes very dark. When these are found, it is time to isolate the fowl and look for other symptoms. If there is no improvement in a day or two, kill it, and burn or bury deeply.

Birds often catch a cold during severe changes of weather. The birds get dull and sluggish in their movements, and have a tendency to sneeze, and in the more severe cases, the rattling in the throat becomes quite pronounced. For such cases, isolate the bird and give a pill composed of equal parts ginger, mustard and cayenne pepper. First, mix them dry. Use sufficient lard to form a paste. Add just enough flour to make an adhesive dry paste. Work into pills the size of a marble and keep for present or future use.

Put permanganate of potash in the drinking water of the whole flock. If it is a valuable bird, bathing the head and nostrils with a warm solution of permanganate of potash in water and swabbing out the mouth and nose will assist. Repeat this treatment daily until recovery.



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